

DANUBIAN ROUTE OF THE YAMNAYA CULTURE

THE BARROWS OF VOJVODINA



Edited by
Paweł Jarosz, Jovan Koledin,
and Piotr Włodarczak



ARCHAEOLINGUA

THE YAMNAYA IMPACT ON PREHISTORIC EUROPE

ARCHAEOLOGIA

Edited by
ERZSÉBET JEREM and WOLFGANG MEID

Volume 43

THE YAMNAYA IMPACT ON PREHISTORIC EUROPE

Volume 3

Series editor
VOLKER HEYD

**DANUBIAN ROUTE
OF THE YAMNAYA CULTURE
THE BARROWS OF VOJVODINA**

Edited by
Paweł Jarosz, Jovan Koledin, and Piotr Włodarczak



BUDAPEST 2021

The publication of this volume was funded by the Institute of Archaeology and Ethnology, Polish Academy of Sciences under the project of the National Science Centre (Kraków, Poland), grant OPUS 8 agreement no. 2015/17/B/HS3/01327 – Danubian route of the Yamnaya culture



Front Cover

The barrow of “Jurišina humka” in Žabalj, Serbia. Photo by Piotr Włodarczak

Back Cover

Sunset on the barrow “Medisova humka” in Žabalj, Serbia.
Photo by Remi Benali/National Geographic

ISBN 978-615-5766-50-3

HU-ISSN 1215-9239

HU-ISSN 2786-2968

© The Authors and Archaeolingua Foundation

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording or any other information storage and retrieval system, without requesting prior permission in writing from the publisher.

2021

ARCHAEOLOGIA ALAPÍTVÁNY

H-1067 Budapest, Teréz krt. 13.

Cover design: Móni Kaszta

Copy editor: Kyra Lyublyanovics

Desktop editing and layout by Rita Kovács

Printed by Prime Rate Kft.

Contents

PAWEŁ JAROSZ – JOVAN KOLEDIN – PIOTR WŁODARCZAK	
Editors' preface	7
PIOTR WŁODARCZAK	
Investigations of prehistoric barrows in Bačka – Introduction	9
MARCIN M. PRZYBYŁA – MICHAŁ PODSIADŁO	
Magnetic prospection on Yamnaya culture burial mounds in Bačka	29
URSZULA BUGAJ – PAWEŁ JAROSZ – JOVAN KOLEDIN – MICHAŁ PODSIADŁO – PIOTR WŁODARCZAK	
Excavation of “Ciganska humka” in Šajkaš	47
BARTŁOMIEJ SZ. SZMONIEWSKI – PAWEŁ JAROSZ – JOVAN KOLEDIN	
Barbarian warrior (?) burial from Ciganska humka barrow in Šajkaš	71
PIOTR MĄCZYŃSKI – MIŁOSZ HUBER	
Analysis of the lithic inventory from grave No. 3 from “Ciganska humka” in Šajkaš	83
DANUTA MAKOWICZ-POLISZOT	
Analysis of animal bones from “Ciganska humka” in Šajkaš	91
PAWEŁ JAROSZ – JOVAN KOLEDIN – MICHAŁ PODSIADŁO – PIOTR WŁODARCZAK	
Excavation of “Medisova humka” in Žabalj	103
MARIO NOVAK	
Bioarchaeology of Yamnaya skeletons from Vojvodina	137
ANITA SZCZEPANEK	
Stable carbon and nitrogen isotope analysis of the Yamnaya culture individuals from Vojvodina	149
ANITA SZCZEPANEK – PAWEŁ JAROSZ – PIOTR WŁODARCZAK – ZDZISŁAW BELKA	
Yamnaya societies in Vojvodina: a strontium isotope perspective	159
ŁUKASZ MAJCHRZAK – PIOTR WŁODARCZAK	
Did the Yamnaya societies mummify their dead? The case of skeletons from Vojvodina	169
MARIA LITYŃSKA-ZAJĄC	
Wood and charcoal from two barrows of “Ciganska humka” at Šajkaš and “Medisova humka” at Žabalj (Vojvodina, Serbia)	185
JÁNOS DANI	
Milleker's pride and joy	195

VIKTÓRIA MOZGAI – BERNADETT BAJNÓCZI
Non-destructive handheld XRF analysis of Early Bronze Age gold finds from Uljma 207

PIOTR WŁODARCZAK
Eneolithic and Early Bronze Age barrows in Vojvodina 215

List of contributors 257

Eneolithic and Early Bronze Age barrows in Vojvodina

PIOTR WŁODARCZAK

Abstract

The number of barrows dating back to the 4th and 3rd millennia BC known from Vojvodina is small. In recent years, the source basis has been somewhat extended thanks to the excavations carried out at two barrows from the Bačka region, in Šajkaš and Žabalj. The still relatively sparse data available allows for three horizons to be distinguished when barrow cemeteries were established in that area. The earliest stage is marked by barrows hiding cremation burials linked with the Baden-Coțofeni circle (ca. 3300–3100 BC). The second horizon is that of early Yamnaya culture barrows, and the third and largest group are finds associated with the classic/younger Yamnaya culture. In general, graves associated with the main, allochthonous variant of the funerary rite (with its genesis in eastern Europe) prevail in the analysed area, a variant known throughout the western fringes of the Eurasian Steppe Belt.

Key words: Eneolithic, Early Bronze Age, Yamnaya culture, Vojvodina, funeral rite

1. Introduction

Recent years have seen intensification of research on the expansion of steppe communities to the Danube basin during the 4th and 3rd millennia BC. As a result, relatively recent attempts at recapitulation (i. a. ANTHONY 2007; WŁODARCZAK 2010; HEYD 2011) have not aged well. This is particularly due to the publications of results of new field research on barrows, which significantly change the pictures drawn for individual regions in classic studies published decades ago (e.g. for Hungary: ECSÉDY 1979; for Bulgaria: PANAYOTOV 1989). The increase in finds and specialist analyses has been particularly noteworthy for regions such as Muntenia (e.g. FRÎNCULEASA *et al.* 2015; PREDA-BĂLĂNICĂ *et al.* 2020), north-eastern Bulgaria (KAISER – WINGER 2015; ALEXANDROV – KAISER 2016; ALEXANDROV 2021), eastern Thrace (ALEXANDROV 2020), or the Great Hungarian Plain (DANI 2011; HORVÁTH *et al.* 2013). Against this background, the data available on barrow communities from the lower Tisza basin, i.e. from Vojvodina (Republic of Serbia), appears very modest (*Fig. 1*). The region in question marks the westernmost part of the Eurasian Steppe Belt, and it occupied an important location on the route of nomadic migrations, often originating from eastern Europe, both in prehistory and in historic times.

From the geographical perspective, Vojvodina is part of the Pannonian Plain. The genesis of both these lowland areas reaches back to the geologically distant times of the Paratethys. As far back as the Jurassic period, the sea extended over what today are lowlands of northern Pontic, northern Balkans, and the Pannonian Basin, among other places (RÖGL 1999). Thus, the steppe areas in the Danube and Tisza basins and those in the north Pontic zone share similar geological, geomorphological, soil, and botanic characteristics, as well as similar historical trajectories. Due to these shared characteristics, and also due to the role of major river valleys (the Danube in particular) as communication arteries, migrations of peoples from the eastern part of the Eurasian steppe to the ecologically equivalent area of the Pannonian Plain was a recurrent pattern for thousands of years. The following discussion is concerned with the earliest two stages of these migrations, linked with the Eneolithic and Early Bronze

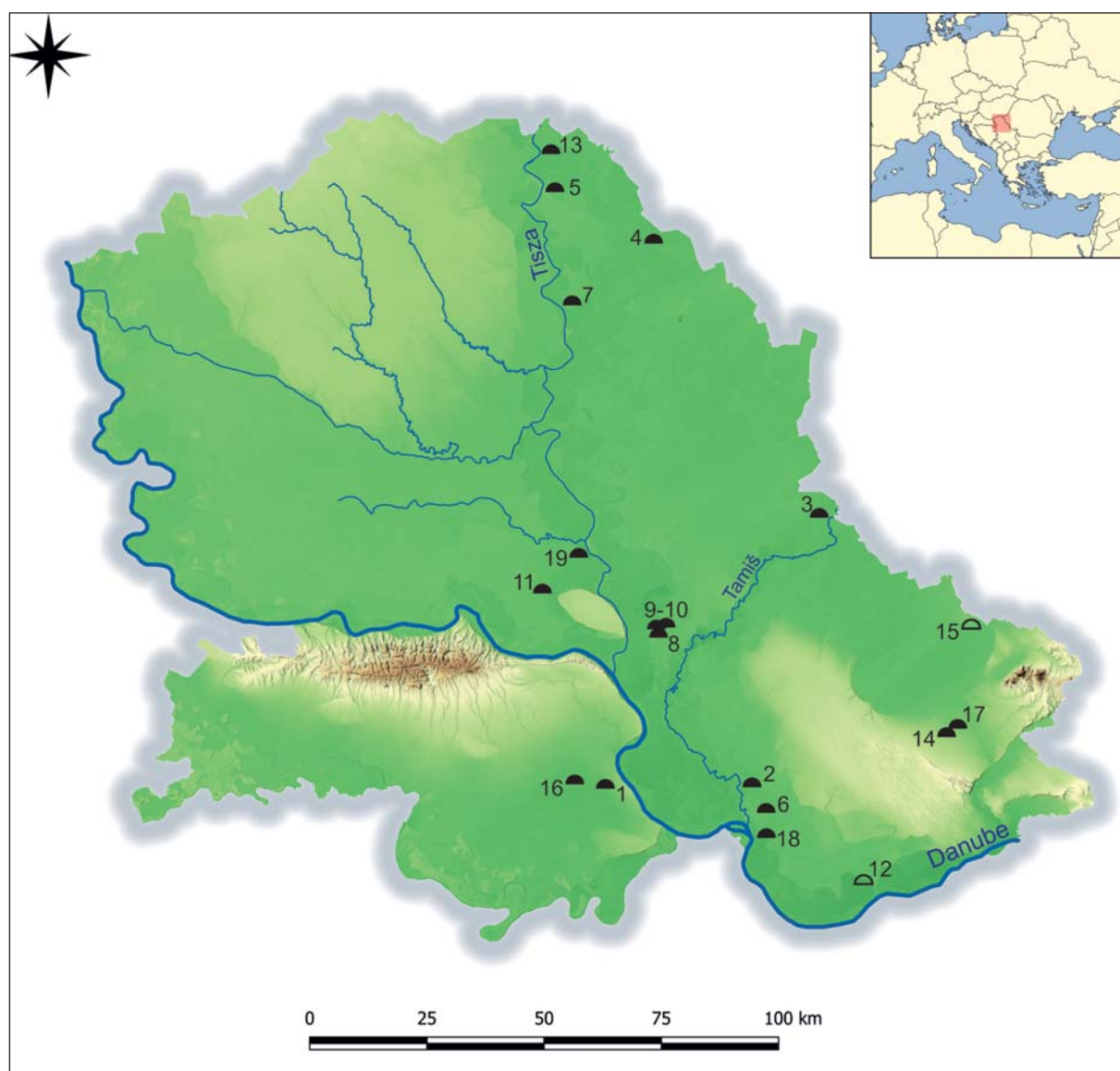


Fig. 1. Location of barrows in the area of Vojvodina. 1 – Batajnica, “Velika humka”, 2 – Jabuka-Tri humke, 3 – Jaša Tomić, “Velika humka”, 4 – Mokrino, “Arađanska humka”, 5 – Novi Kneževac, “Japina koliba”, 6 – Pančevo-Livade, 7 – Padej, “Humka u Barnahatu”, 8 – Perlez-Batka C, “Pašićeva humka”, 9-10 – Perlez-Vuna, barrows 9 and 10, 11 – Šajkaš, “Ciganska humka”, 12 – Skorenovac, “Grmušina humka”, 13 – Srpski Krstur, “Slatinska humka”, 14 – Uljma, “Itebejeva humka”, 15 – Vatin, 16 – Vojka, “Humka kod Velikog Begeja”, 17 – Vlajkovac, “Straža”, 18 – Vojlovica-Rafinerija nafte, 19 – Žabalj, “Medisova humka”.
Illustration by R. Skrzyniecki, P. Włodarczak

Age (4th–3rd millennia BC). In that period, the area of Vojvodina was of special importance for pastoral communities with origins in eastern Europe, because of both the economic advantages it offered and its strategic geopolitical location.

The migrations of nomadic peoples brought about the diffusion of a new trend in funerary rituals: the barrow rite. From the outset this leading expression of ceremonial behaviour of the newcomers from the East gained acceptance among the local communities, which resulted in changes to the local funeral rites. This situation finds a good analogy in the northwestern Pontic area, where in the second

half of the 4th millennium BC a similar barrow ritual is used both by local communities of phase C/II of the Trypilia culture (DERGACHEV – MANZURA 1991) and by populations of steppe origins known as the Zhivotilovka-Volchansk group (MANZURA 2016). By around the middle of the 4th millennium BC, barrows had become an established element in the funerary rites of various cultural groupings in Central Europe, not only those with origins in eastern Europe. Thus, the discussion of the allochthonous or local origin of the population constitutes a legitimate part of the study of funerary rites in the Danube-Tisza zone. This aspect comes to the fore in particular when discussing barrows containing relatively numerous local elements, as in the case of materials from eastern Thrace (ALEXANDROV – KAISER 2016). It is also important for Vojvodina, where the barrow rite was used by the Baden culture at the end of the 4th millennium BC. In the first half of the 3rd millennium BC, barrows were present in the ritual of the Vučedol culture, as exemplified by burials from Batajnica and Vojka, sites located in the Srem region of southern Vojvodina (recently: SPASIĆ 2016). However, in contrast to the older period (so far still relatively poorly understood), the majority of the Vojvodina barrows from 3000–2500 BC are associated with the Yamnaya culture – a unit having clear eastern European connotations. The picture of the cultural situation is still far from clear, however, due to the small number of sites surveyed – undoubtedly unrepresentative for fully reliable reconstructions of the process of “kurganisation” of Eneolithic and Early Bronze Age funerary rituals. This perhaps accounts for the fact that burials attesting to the oldest intrusions of barrow peoples from the 4th millennium BC are currently missing in the Vojvodina archaeological record (JOVANOVIĆ 1979, 381–384). At the same time, the strategic location on the route used by pastoral communities moving from the east to the northern part of the Pannonian Plain suggests that such early dated barrows should also be present in this area.

2. History of research

The beginnings of research on the Vojvodina barrows are connected with Felix MILLEKER, a teacher and history enthusiast from Vršac, who undertook excavations in Uljma, Vatin and Vlajkovac at the turn of the 20th century (e.g. MILLEKER 1901; 1906; JANKULOV 1936; JOVANOVIĆ 1976a, 12; BATISTIĆ-POPADIĆ 1986, 17, 35; DANI 2021). In two cases: “Itebejčeva humka” in Uljma and “Humka Straža” in Vlajkovac, the published descriptions allow these mounds to be reliably linked with Yamnaya culture communities. While no systematic excavations were carried out in the interwar period, test trenches were then explored for the first time in large mounds: “Slatinska humka” in Srpski Krstur (NADLAČKI 1950) and “Velika humka” in Jaša Tomić (JANKULOV 1937).

After World War II, excavations were carried out on two barrows from Srem (Syrmlia): in Batajnica (“Velika humka”; TASIĆ 1959; 1967, 59, 60; SPASIĆ 2016) and in Vojka (“Humka kod Velikog Begeja”; TASIĆ 1967, 60; SPASIĆ 2016, 167). “Arađanska humka” barrow was partly explored in Mokrin, leading to the discovery of a cremation in an urn (Baden culture) and an inhumation burial linked to steppe communities (GIRIĆ 1974, 21; 1987, 73; 1994, 8). It was not until the excavations at Vojlovica (now a district of Pančevo) in 1965 and 1969 that the first comprehensive results were obtained, and it became possible to credibly relate the examined barrow to the ritual of the “ochre grave community” with origins in the eastern European steppe (JOVANOVIĆ 1969; 1974a; 1976a; 1976b). The data obtained in Vojlovica were then often used in various synthetic approaches (e.g. JOVANOVIĆ 1974b, 175–177). In the 1970s and 1980s, research was conducted on several more barrows: Jabuka-Tri humke (BUKVIĆ 1982; 1987), Perlez, “Pašićeva humka” (MEDOVIĆ 1987), Perlez-Vuna, barrows 9 and 10 (MEDOVIĆ 1987), Padej, “Humka u Barnahatu” (GIRIĆ 1982; 1987) and Novi Kneževac, “Japina koliba” (GIRIĆ 1982; 1987). The state of research on the barrows in Vojvodina was summarized in conference materials published

in 1987 (BUKVIĆ 1987; GIRIĆ 1987; MEDOVIĆ 1987). Until the 21st century, it was these relatively few sources that provided the basis for subsequent synthetic approaches discussing allochthonous steppe communities (e.g., JOVANOVIĆ 1974b; 1979; TASIĆ 1977; 1983; 1995). In most cases, however, these data were either incomplete, i.e. concerning partially explored barrows, or not fully published. Already in the 21st century another barrow was accidentally investigated in Pančevo-Livade (ĐORĐEVIĆ – ĐORĐEVIĆ 2016). As a result, synthetic studies from the beginning of this century still repeated information on the few discoveries mentioned above (e.g. TASIĆ 2004; 2007).

In an attempt to broaden the source base, a Polish-Serbian project of field research was conducted in 2016–2018 in the Bačka region (KOLEDIN *et al.* 2020; WŁODARCZAK 2021a). Two barrows were excavated at that time: in Šajkaš (BUGAJ *et al.* 2018; 2021) and in Žabalj (KOLEDIN *et al.* 2020; JAROSZ *et al.* 2021). The results of the project have significantly enriched the knowledge about the funerary ritual of the Yamnaya culture on the lower Tisza River. However, they have not been enough to change the state of recognition of the barrows of Vojvodina, which, given their large number and cultural, regional and chronological diversity, still remains dramatically weak. The good results of the project should provide the justification to continue this promising research on the migrations of steppe communities in the southern part of the Pannonian Plain.

3. Source basis

The basis for the study of the barrow burial rite in Vojvodina is the data from excavation of 19 barrows (*Table 1*). A significant proportion of these are sites that have only been partially explored or for which we do not have sufficiently authoritative information. Comprehensive data from fully excavated barrows are only available in four cases: Jabuka-Tri humke, Vojlovica-Rafinerija nafte and the two newly explored barrows in Šajkaš and Žabalj. The mound at Pančevo-Livade was also fully excavated, but it was heavily damaged by a medieval sacral-funeral complex (ĐORĐEVIĆ – ĐORĐEVIĆ 2016). For Jabuka-Tri humke and Vojlovica-Rafinerija nafte, the materials have only been partially published. This is a particularly inconvenient circumstance in the case of the first of these barrows, under which an interesting sequence of settlement traces was discovered, linked to the Baden and Kostolac cultures. Clarifying the stratigraphic and chronological relationship between these traces and the Yamnaya burial would be important from the perspective of studying the relationship between barrow communities and the local population.

Model examples of barrows linked to the Yamnaya culture are the two recently investigated mounds from Bačka: “Ciganska humka” in Šajkaš and “Medisova humka” in Žabalj. Both were 40-50 m in diameter and had a reconstructed height of about 3 m. The Šajkaš mound was partially levelled and eroded by ploughing. In contrast, the form of the barrow from Žabalj has not changed significantly since the Early Bronze Age (*Fig. 2*). Therefore, this latter mound can be considered as a model construction. Both mounds were two-phase structures – each was extended once in connection with the digging of a single secondary burial. Single-phase barrows – such as those at Jabuka-Tri humke, Vojlovica-Rafinerija nafte, or Perlez-Vuna 9 and 10 – were presumably clearly lower (probably reaching about 1.5-2 m) and may have been slightly smaller in diameter (about 30-35 m).

However, good data on large mounds that are more than 4 m high is largely absent. It can only be assumed that these were multi-phase structures. One such barrow is “Slatinska humka” from Srpski Krstur in northern Banat (NADLAČKI 1950). Traces of cremation and an amphora decorated with cord impressions (*Fig. 3.1*) discovered there probably originate from the central burial, dated most probably to the end of the 4th millennium BC. The barrow, however, has only been explored with a trench crossing

the central part of the mound. Given the small sizes of barrows from the 4th millennium BC, it is almost certain that “Slatinska humka” was extended (most likely several times) in the Early Bronze Age by communities of the Yamnaya culture, with the associated burials located outside the explored area. Another large barrow, “Velika humka” in Jaša Tomić (also measuring 8 m in height), was also only partially explored (JANKULOV 1939). Judging from the description, the only grave discovered there shows features of the Yamnaya culture. However, we cannot be certain that this is the oldest burial in this barrow.

Table 1. Dimensions of archaeologically excavated barrows from Vojvodina

Site	Date of excavation	Diameter [m]	Preserved height [m]	References
Batajnica, “Velika humka”	1958–1959	30	2.5	TASIĆ 1959; 1967, 59, 60; SPASIĆ 2016
Jabuka-Tri humke	1981	48	2.3	BUKVIĆ 1982; 1987
Jaša Tomić, “Velika humka”	1937	?	8	JANKULOV 1939
Mokrin, “Arađanska humka”	1961	50	4	GIRIĆ 1974, 21; 1987, 73; DIMITRIJEVIĆ 1979, 204; SACHSSE 2010, 67, 68
Novi Kneževac, “Japina koliba”	1981	ca. 25-30	3	GIRIĆ 1987
Pančevo-Livade	2013	40	0.5	ĐORĐEVIĆ – ĐORĐEVIĆ 2016
Padej, “Humka u Barnahatu”	1978–1979	60	4.3	GIRIĆ 1982, 102–103; 1987; 1994, 10
Perlez-Batka C, “Pašićeva humka”	1975–1983	50	3	MEDOVIĆ 1987
Perlez-Vuna, barrow 9	1983	30	0.8	MEDOVIĆ 1987, 78
Perlez-Vuna, barrow 10	1984	30	?	MEDOVIĆ 1987, 79
Šajkaš, “Ciganska humka”	2016	50	2.5	BUGAJ <i>et al.</i> 2017; 2021
Skorenovac, “Grmušina humka”	1949	?	?	GARAŠANIN 1959, 39; UZELAC 2002, 33
Srpski Krstur, “Slatinska humka”	1928–1929	70-80	8	NADLAČKI 1950
Uljma, “Itebejčeva humka”	1901	44	3	MILLEKER 1901, 19–22; JOVANOVIĆ 1974, 12; ECSSEDY 1979, 18; UZELAC 2002, 34, 35; DANI 2021
Vatin	End of the 19 th century	?	?	JOVANOVIĆ 1974, 13; GIRIĆ 1982, 101
Vojka, “Humka kod Velikog Begeja”	1960	25	2.5	TASIĆ 1967, 60; SPASIĆ 2016, 167, 168
Vlajkovac, “Straža”	1907	40	3.5	MILLEKER 1906, 194, 195; JOVANOVIĆ 1974, 12, 13;
Vojlovica, “Rafinerija nafte”	1965, 1969	35	1.5	JOVANOVIĆ 1974, 12; 1976a; 1976b
Žabalj, “Medisova humka”	2017–2018	40	3.2	JAROSZ <i>et al.</i> 2021

In three cases, burials dated to the end of the 4th millennium and linked to the Baden and Coţofeni complexes were discovered under barrows. In northern Banat, apart from the above-mentioned find from “Slatinska humka” in Srpski Krstur, a Baden culture cremation burial was discovered under the partially explored barrow of “Arađanska humka” in Mokrin (*Figs 3.2, 3*; GIRIĆ 1987, 73, 74). Neither the details of the stratigraphic situation, nor the plan of the barrow are known, which means we are lacking the materials which would make it possible to clarify the relation between the cremation and the inhumation grave discovered nearby, the latter linked to the communities of the steppe circle. Even



Fig. 2. Žabalj, “Medisova humka” – the typical barrow of the Yamnaya culture. Photo by Piotr Włodarczak

less precise is the information regarding the third case, the “Grmušina humka” barrow at Skorenovac in southern Banat. It is known that Baden culture and Early Bronze Age pottery was discovered under the barrow, as well as skeletons in a contracted position. However, the relationship between these findings is not known (UZELAC 2002, 33).

Due to the specific nature of the only two barrows explored in the region (Batajnica – “Velika humka” and Vojka – “Humka kod Velikog Begeja”), Srem (Syrmia) is regarded as a separate province in the studies on Vojvodina barrows (e.g. JOVANOVIĆ 1979; GIRIĆ 1982; TASIĆ 2004). These are the only two mounds where cremation burials linked to the Vučedol circle were discovered. It remains an open question whether the finds from Batajnica and Vojka reflect the character of all barrows from the late 4th and the first half of the 3rd millennium BC located in Vojvodina south of the Danube (i.e. in Srem).

4. The barrow rite in the 4th millennium BC

The last 20 years have seen a significant increase in the body of data available on the barrow burial rite in the 4th millennium BC. This applies to various regions, unfortunately excluding the territory of Vojvodina. Progress is evident in the identification of specific burial types and with regard to the possibility of relating them to parallel phenomena in the North Pontic zone (e.g. ALEXANDROV 2010; ALEXANDROV – KAISER 2016; FRÎNCULEASA *et al.* 2017a; 2019; DANI 2021). In particular, studies conducted for cemeteries from Muntenia have shown that in many barrows, Yamnaya culture burials occupied a secondary position in relation to graves from the Pre-Yamnaya period (FRÎNCULEASA *et al.* 2019a, 61, 62). In this recently relatively intensively studied area, the difference between this older ritual and the ritual characterizing Yamnaya communities has become relatively clear.

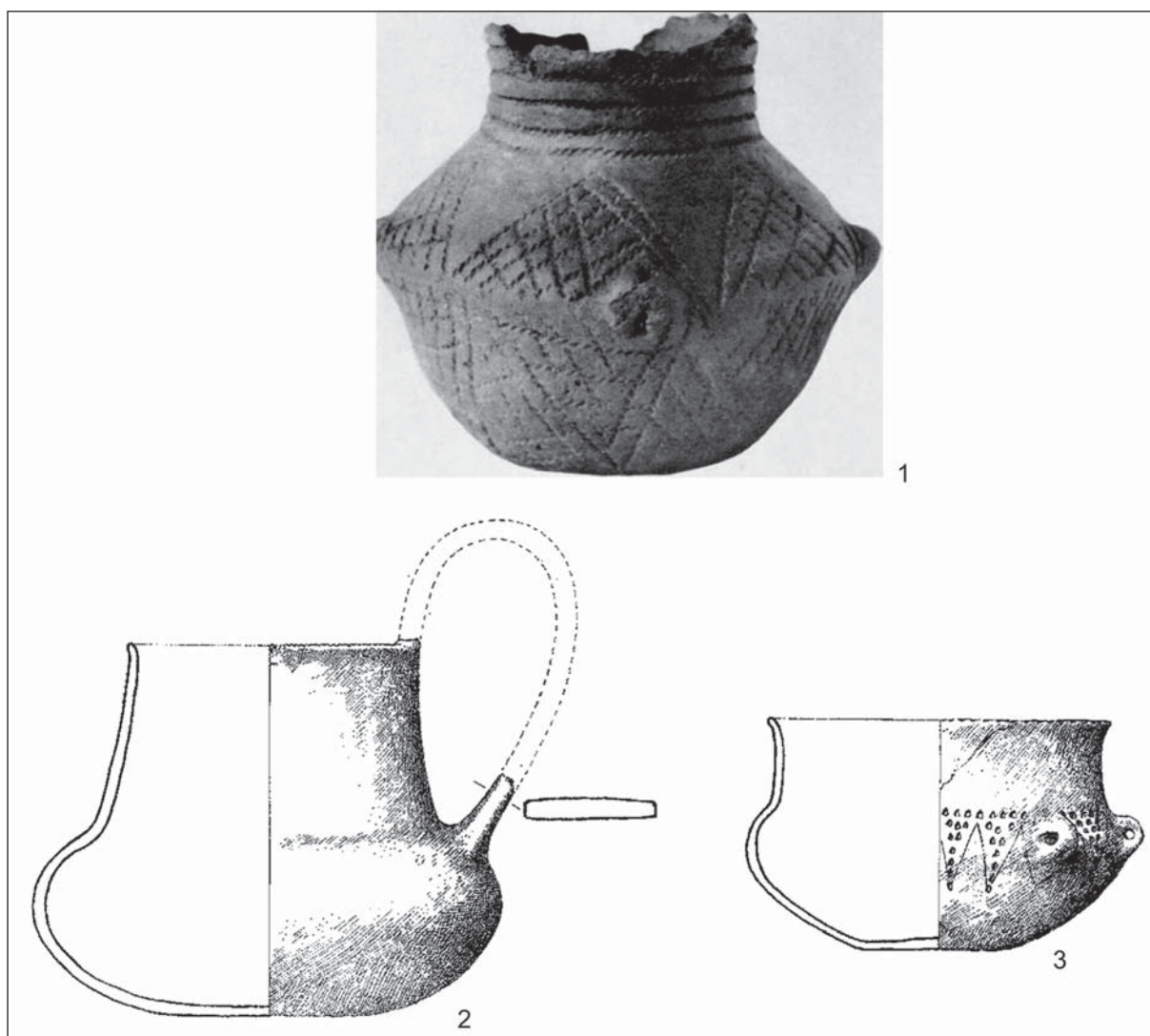


Fig. 3. Vessels found in the barrows from Vojvodina: 1 – Srpski Krstur, “Slatinska humka”, 2, 3 – Mokrin, “Arađanska humka” (after GARAŠANIN 1959; DIMITRIJEVIĆ 1979)

In the 4th millennium BC, the barrow rite appears in two different contexts in the Danube-Tisza zone. The first one is linked to the expansion of various steppe communities from eastern Europe. In the second, barrows appear as a result of the adaptation of a new funerary ideology by local Eneolithic/Early Bronze Age communities. Only seemingly is this distinction sharp and logical. In practice, in many cases it is difficult to indicate the allochthonous or autochthonous origin of the reconstructed rituals. We have to consider diverse, ambiguous patterns here, which at the same time show regional variability. Currently, the hope to help unravel the origins of barrow rituals is seen in aDNA analyses guiding the reconstruction of demographic changes in the 4th and 3rd millennia BC (e.g. KRISTIANSEN *et al.* 2017; SCORRANO *et al.* 2021). These analyses may possibly reveal differences in the share of allochthonous population among individual cultural and territorial groupings.

In the second half of the 4th millennium BC, the funerary ritual of the Zhivotilovka-Volchansk group begins to play a leading role in the North Pontic zone. This phenomenon was distinguished by I. F. KOVALEVA (1978) and further clarified by Yu. Rassamakin (among others, RASSAMAKIN 1999,

92–97; 2004, 126–134). Its most notable feature is that it crosses geographical barriers, resulting in a funerary ritual combining features from both Northern Caucasus and the northwestern Black Sea (RASSAMAKIN 1993; MANZURA 2016, 150–152). Artefacts from graves of the Zhivotilovka-Volchansk group find analogies in the materials of the Maykop culture and the Late Trypilia group of Gordinești-Kasperovtsi. The phenomenon covered a huge area: between the lower Danube and the lower Don. The Danube-Tisza zone of expansion of steppe communities, which is of particular interest to us here, was at the limit of its range. Graves revealing distinct features of the Zhivotilovka-Volchansk group have only been discovered in southeastern Romania, the most important discoveries being Liești-Arbănașu (grave 22), Gherașeni (grave 119), and Brăilița (grave 20; FRÎNCULEASA *et al.* 2019a, 86, pl. 8). Some similarity to the ritual of the Zhivotilovka-Volchansk group can also be noticed in collective burials from Muntenia, including graves 1 and 2 from Ploiești-Gara de Vest (FRÎNCULEASA *et al.* 2019a, 80–84, Pl. 2–6), graves 3–5 from Aricești IV (FRÎNCULEASA *et al.* 2015, 101–103, Pl. 7–9), and grave 4 from Paulești III (FRÎNCULEASA *et al.* 2015, 107, pl. 13: 5). However, these burials also show clear differences from the North Pontic ritual. Their furnishings, in which objects characteristic of local cultural groups play an important role, are distinctly different. In Vojvodina, as in the entire Pannonian Plain, no burials explicitly referring to the ritual of the Zhivotilovka-Volchansk group have yet been discovered. It is possible, however, that a group of barrow burials from the second half of the 4th millennium BC can also be distinguished in this zone, characterised by burials in a contracted position on the side, a reference to the pattern typical of the Late Trypilie world/the Zhivotilovka-Volchansk group (FRÎNCULEASA *et al.* 2019a, pl. 19: 4). Chronometrically documented examples of such a ritual are graves 10 and 12 from Sárretudvari-Órhalom (DANI – NEPPER 2006, 37, 38, figs 7: 3 and 8: 3).

The geographical position of Vojvodina makes it safe to assume the presence in this area of barrows with inhumation burials, dating to the second half of the 4th millennium BC. This is indirectly suggested by discoveries from the lowland areas further north on the Tisza. Another argument attesting to the presence of early dated waves of barrow communities is the evolution of burial rites in local cultural groupings (primarily: Baden and Coțofeni). New elements appear in the rituals, mainly in the context of cremation burials, and among them is the idea of marking some graves by raising barrows over them.

5. The cremation rite in the barrow context

A separate problem in the barrow ritual is the custom of cremating bodies of the deceased, and especially placing cremated human remains in urns. This rite is strongly connected with local cultural traditions, where in the 4th millennium BC cremation became deeply entrenched in funerary practices. That period saw a “process of stabilization of cremation as a *separate funeral rite*” (KOŠKO 2001, 409; cf. also KOŠKO – VIDEIKO 1995). In Vojvodina, cremation appears in barrow contexts in two chronological horizons: the older one, linked with the Baden-Coțofeni complexes, and the younger one, linked with the Vučedol complex. In both cases, the relationship between barrows with cremation and the new rituals spreading with the expansion of eastern European steppe communities is a complex issue. The older variant is represented by barrows with cremation burials from Šošari-Sač and Tolisavac-Banjevci in western Serbia, dated to the Boleráz horizon (GARAŠANIN 1987). However, particularly significant chronometric data were obtained elsewhere, namely from barrows at Silvașu de Jos-Dealul Țapului in northern Banat (LUCA *et al.* 2012; DIACONESCU 2020). The data clearly revealed the two-phase nature of the barrow cemetery, with the older phase associated with the Coțofeni culture and the younger phase with the Yamnaya culture. There was also a clear hiatus between the two stages (DIACONESCU 2020, 23). Radiocarbon dating of the older phase points to around 3300–3100 BC, while the pottery style points

to stage III of the Coțofeni culture. The discoveries from Silvașu de Jos perfectly illustrate a frequently occurring pattern of succession of ceremonial-funeral centres in the 4th and 3rd millennia BC. The first phase consists of small barrows erected above burials and accompanying other ceremonial installations (such as hearths, stone structures, and vessel deposits) of the Baden-Coțofeni cultures. Subsequently, these barrows were used by Yamnaya communities, who – while digging burials into their mounds – significantly increased their diameters and heights. An example of such a sequence is the barrow of Bucova Pusta IV, where a cremation burial of the Baden or Coțofeni culture and a typical burial of the Yamnaya culture were discovered (KRAUSS *et al.* 2016, 298–301). At the same time, the current state of knowledge allows a more cautious approach to interpretations that assume a symbiosis of steppe and local (Baden) ideas in some barrows, e.g. in Mezőcsát–Höröcsögös and Tiszavasvári–Gyepáros located in Hungary (KALICZ 1999). It is possible that we are actually dealing with two distinct chronological phases in these badly damaged mounds: the Badenian and the Yamnaya.

In considering the relationship between the Baden-Coțofeni complex and the barrow trend, the interpretation of the finds from barrow No. 1 (“Glavchovska mogila”) from Tarnava in northwestern Bulgaria plays an important role (NIKOLOV 1976). What has been typically emphasised in this context is the influence of steppe groupings on the funerary ritual of local communities (e.g. JOVANOVIĆ 1992). Synthetic approaches pointed directly to the presence of vessels of the Coțofeni culture in the Yamnaya culture graves, which was said to attest to “alliances or patron-client contracts” between the “leaders” of the two communities (ANTHONY 2007, 366). These interpretations must now be verified, using the results of new studies (including the aforementioned Silvașu de Jos), and advances in chronometric research. Another reason why the verification of the sources from “Glavchovska mogila” is significant is because it revealed some shortcomings and mistakes in earlier publications (ALEXANDROV 2019). A careful analysis of the finds indicates that the Yamnaya culture horizon only corresponds to the youngest of the three main phases distinguished for barrow 1 at Tarnava, with which graves 7–10 are connected. The two older phases, on the other hand, are connected with the Pre-Yamnaya period and should be dated to the second half of the 4th millennium BC. Importantly, both inhumation burials and cremations are present in these older periods, and some ritual features are similar to those of the Yamnaya culture (e.g. the use of wooden structures, and ochre painting). Pit graves with urns, covered by wooden roofs, suggest inspiration from the newly spreading Yamnaya trend. No doubt hard chronometric data would be of much help in this case. A relatively late age of the Coțofeni culture materials, contemporary with the age of the early Yamnaya culture (c. 3100–3000 BC), cannot be ruled out. The stylistic dating of the pottery from “Glavchovska mogila” to the Coțofeni III phase (i.a. ALEXANDROV 2019) allows such an interpretation. Unlike most other examples (including Silvașu de Jos mentioned above), the barrow from Tarnava shows a clear chronological overlap between the local and allochthonous/steppe traditions in funerary ritual, as well as the uninterrupted use of the barrow cemetery in the late 4th and early 3rd millennium BC.

In Vojvodina, the early manifestations of cremation ritual in a barrow context are enigmatic. They were recorded beneath the barrows from Srpski Krstur and Mokrin (GIRIĆ 1987) in northern Banat. In both cases the data on the stratigraphic situation are perfunctory and make it impossible to fully reliably connect the discovered cremation graves with the barrow mound (although such a connection should be considered very probable). In the southern part of Banat, a testimony of the barrow practices of the Baden culture is probably “Grmušina humka” at Skorenovac, a mound within which fragments of Baden culture vessels, were discovered long with thirteen inhumation burials (GARAŠANIN 1959, 39, note 204). In this case, however, information on the relationship between the pottery and the graves, as well as details of the funerary rites, are lacking. If the pottery was connected with the funerary ritual (rather than reflecting a Baden culture settlement existing before the construction of the barrow), then it is likely that

this barrow may also have contained cremation graves, and the inhumation burials (all or some of them) may be connected with a younger stage of the barrow's use.

The fact that the barrows at Mokrin and Srpski Krstur were only partially explored means that the sequences of their use cannot be reconstructed. As mentioned, the large sizes of these mounds indicate the presence of an episode or episodes of extension dating to the first half of the 3rd millennium BC. The inhumation burial in Mokrin could possibly be associated with such episode, but – contrary to M. GIRIĆ's (1987) suggestions – it does not display features that would allow its unquestionable attribution to the Yamnaya culture (the opinion based on descriptions – the graphic documentation of this grave has never been published).

The Baden culture vessels from Mokrin (*Fig. 3. 2, 3*) are connected with the Late Classic stage (stage C) and were classed by S. Dimitrijević in the Hódmezővásárhely-Bodzáspart type (DIMITRIJEVIĆ 1979, 204). Their typological features allow us to estimate the chronology of the burial as the very end of the 4th millennium BC. Materials of such date find good analogies at numerous sites in northern Banat (e.g. SAVA 2015, 84–88, figs 11–15). The rich ceramic assemblages retrieved from “Humka u Barnahatu” in Padej (GIRIĆ 1987) and “Pašićeva humka” in Perlez (MEDOVIĆ 1987)¹ can also be dated similarly. These artefacts come from the mound and from features located beneath it. Rich and distinctive late classic material of the Baden culture comes from pit 1 in Padej (pit of trapezium-shaped section). However, the partial examination of the two barrows does not make it possible to determine precisely the nature of the succession of Yamnaya culture graves after the Baden stage. Also here, the presence of cremation burials dated to the end of the 4th millennium BC in unexplored parts of the mounds cannot be ruled out.

Two barrows in the territory of Srem yielded cremation burials linked to the Vučedol circle: “Velika humka” in Batajnica (TASIĆ 1959; 1967, 59, 60; SPASIĆ 2016) and Vojka (TASIĆ 1967, 60). They provided the grounds for suggesting cultural distinctiveness of the Srem zone from the Bačka and Banat regions north of the Danube (e.g. TASIĆ 2004). However, the results of research on merely two mounds are hardly enough to rule out the possibility that some of the relatively numerous barrows from Srem are actually associated with the Yamnaya culture, especially since their dimensions and locations in the landscape are the same as in Banat and Bačka (LAZIĆ 1989, 14).

In light of the lack of detailed information about the stratigraphic situation and the construction of the graves, the interpretation of the funerary ritual from the barrows at Batajnica and Vojka is difficult in places. “Velika humka” in Batajnica had a diameter of about 30 m and was 2.5 m high. Thus, its parameters corresponded to standard Yamnaya mounds. At the original ground level, a burnt wooden structure (funeral pyre) of a roughly circular shape and a diameter of about 6 m was recorded (SPASIĆ 2016). Within and slightly above it, fragments of Vučedol culture pottery were found (including fragments of a large *terrina* vessel), as well as fragmented animal bones. In the mound, about 2 m above the wooden structure, two urns were found at a depth of 0.65 m: a Fischbutte-type vessel (showing affinity with the Baden culture) and a small *terrina* vessel (SPASIĆ 2006, 163, fig. 13.2: 1, 2).

Located at a distance of just over 10 km from Batajnica, the barrow at Vojka had similar parameters (a diameter of about 25 m, height 2.5 m; TASIĆ 1967, 60). Also in this case, at the base of the mound the remains of a funeral pyre and fragments of Vučedol culture pottery were discovered, along with two copper artefacts and flint tools. As in Batajnica, an urn with burnt human remains (poorly preserved and undocumented) was discovered within the mound, clearly above the wooden structure. The pottery

¹ Ceramic materials from barrows at Padej have not been published. Their chronological assessment was made on the basis of inspection of the artefacts and analysis of the documentation, stored in the museums of Kikinda and Zrenjanin. I would like to thank Lidija Milašinović (Kikinda) and Aleksandar Šalamon (Zrenjanin) for their help in accessing the materials.

fragments retrieved from the barrow indicate a time horizon similar to that of “Velika humka”, i.e. B1–B2, which is the classic period of the Vučedol culture development (SPASIĆ 2006, 167).

The two barrows from Srem find analogy in Moldova Veche in the Romanian part of the southern Banat (on the Danube), from where two mounds are known, in which three classic Vučedol vessels with cremated remains of the dead were discovered (ROMAN 1976, 145). These discoveries point to a major role of the Danube artery in the eastward expansion of the Vučedol culture community. This trend would find a continuation in the second half of the third millennium, in the similar nature of the expansion of the Bell Beakers community (KOLEDIN 2008). The directions of interactions and population movements in the Pannonian Plain were therefore not determined solely by the expansions of steppe peoples with origins in eastern Europe. These processes were multidirectional and genetically diverse, as in Central Europe (HEYD 2021).

6. Grave 2 from Šajkaš and the question of the Early Yamnaya horizon in the Pannonian Plain

The excavations of “Ciganska humka” at Šajkaš resulted in the discovery of two differently dated graves (BUGAJ *et al.* 2018; 2021; KOLEDIN *et al.* 2020; WŁODARCZAK 2021b). The older one, grave 2, had a specific construction: it was a long and narrow pit whose bottom and lower parts of the walls were covered with wood (*Fig. 4*). The wooden roof of this structure was located approximately at the level of the bottom of grave 1 (a classic Yamnaya culture structure). Because of this, elements of the roof were only partially discernible at the edges of the younger grave and in the fill of the older structure. A



Fig. 4. Šajkaš, “Ciganska humka”. Construction of grave 2. Photo by Piotr Włodarczak

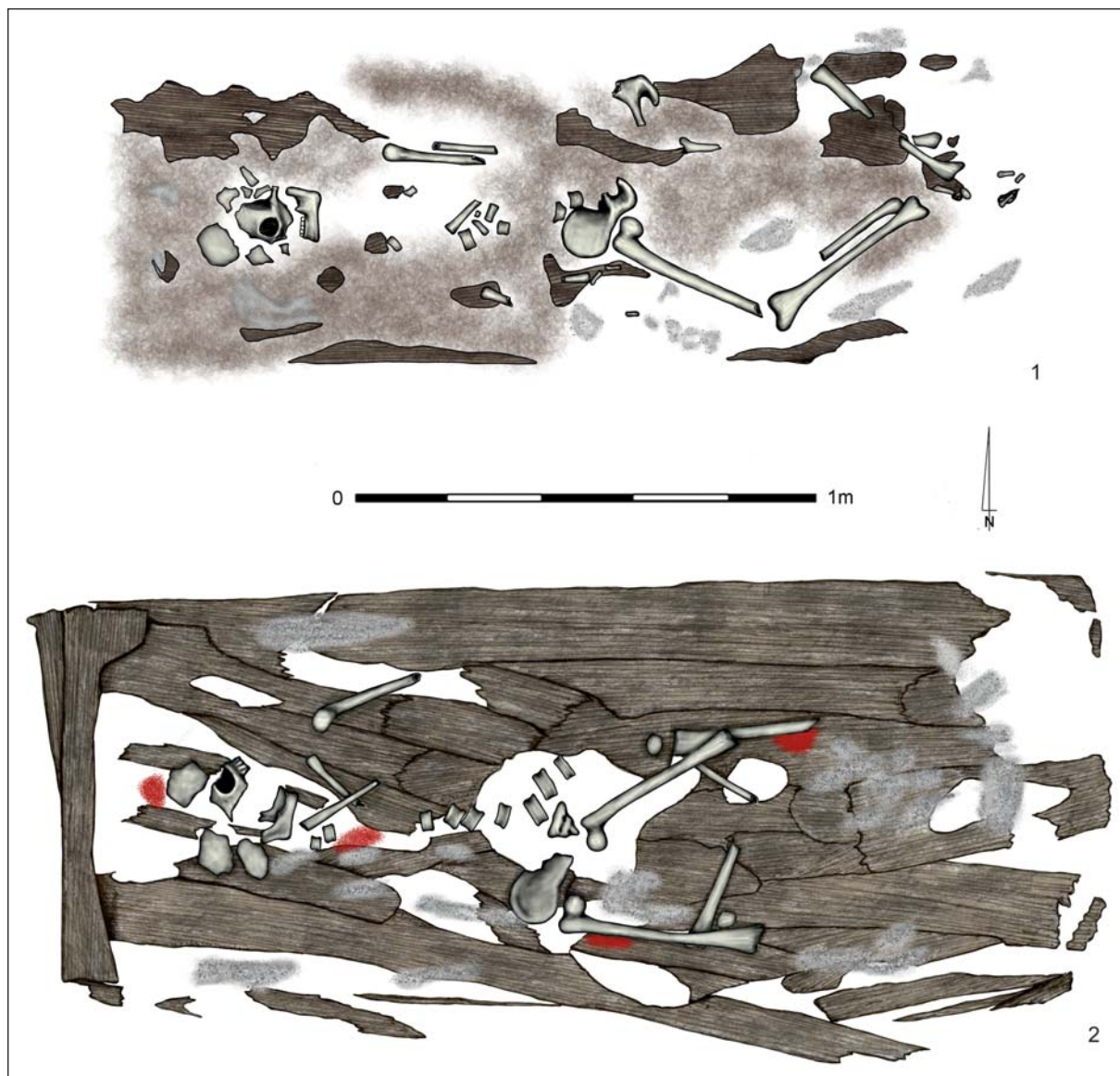


Fig. 5. Padej, “Humka u Barnahatu”. Graves 1 and 2. Drawing by Michał Podsiadło (based on the documentation by M. Girić, stored in National Museum Kikinda)

specific design feature of the wooden floor of grave 2 was that the longitudinally laid wooden elements were limited by short transverse boards. No traces of burial were recorded at the bottom. However, concentrations of a whitish, calcareous substance were documented. Despite the absence of human remains, the features of grave 2 from Šajkaš are diagnostic and find good analogies among structures dated to the early horizon of the Yamnaya culture.

An important analogy to the situation observed at Šajkaš is provided by the results of excavations of the “Humka u Barnahatu” barrow at Padej in northwestern Banat (GIRIĆ 1987). It was a large mound about 60 m in diameter and over 4 m high, explored only by means of a trench cutting through the central section. Two phases of the mound, each associated with a burial, were identified during the research. Correlating with the older phase, grave 1 was not dug into the original ground level, but was located in the bottom parts of the older mound (Fig. 5.1). Such a location results in its stratigraphic position being

slightly ambiguous. However, a similar situation was recorded in “Ciganska humka” at Šajkaš, where grave 2 connected with the older mound had its bottom located on the original ground level. Thus, it is possible that above-ground constructions were one of the variants of the funerary tradition from the turn of the 4th and 3rd millennium BC. A wooden construction in the type of a box would be placed on the surface and then covered with a mound. The absence of a burial pit is a feature found in the barrow ritual from the 3rd millennium BC in the Danube basin and in the North Balkan zone, including Transylvania (CIUGUDEAN 1995, 29; 1996; 2011, 24) and Serbia (GARAŠANIN 1987, 52). This variant of barrow burial, initiated in the early phase of the Yamnaya culture, became established in some areas and continued to be used in later phases of the Early Bronze Age.

Grave 2 from Padej was dug into an older barrow, and corresponded with a layer of a younger mound, which significantly increased the diameter and height of the barrow (*Fig. 5.2*). Thus, in contrast to the situation in “Ciganska humka” at Šajkaš, both graves from Padej had a similar, characteristic construction, typical of the older phase of the Yamnaya culture. They were long but relatively narrow, and their walls were boarded with wooden planks. A unique feature was the use of wood for the floor on which the remains of the deceased were placed. Long, longitudinally laid boards were used for this purpose, closed on both sides by short, transversely laid pieces. Poorly preserved individual inhumation burials were discovered in the graves from Padej (*Fig. 5*). The dead were laid on their backs with only slightly contracted lower limbs, while upper limbs were also slightly contracted and stretched out along the torso. The lower limbs of the burial from grave 1 were characteristically bent outwards, in a so-called “frog position”. In both graves from “Humka u Barnahatu” – as in grave 2 from Šajkaš – the presence of a white, calcareous substance, as well as ochre, was registered.

The graves from Padej are the only close analogies to grave 2 from Šajkaš that can be found in the territory of Vojvodina. Their relationship is also confirmed by radiocarbon dating obtained for grave 2, indicating the years around 3000-2900 BC (GIRIĆ 1982, 103; 1987, 73). Thus, these are graves related to the early phase of the Yamnaya culture in the Pannonian Plain zone. What draws attention is the specific way in which the deceased were placed in these graves: in a position only slightly contracted (almost extended; see *Fig. 5*). In this respect, the Padej burials differ from the pattern most typical for the Yamnaya ritual, the characteristic element of which was a strong bending of the lower limbs, both at the hip and at the knee. In the Pannonian Plain, the arrangement of the dead from graves 1 and 2 in Padej has a good analogy in grave 1 from Püspökladány–Kincsesdomb (NEPPER 1977, 53, 54, photo 5, fig. 1).

The specific constructional features of grave 2 from “Ciganska humka” at Šajkaš and graves 1 and 2 from “Humka u Barnahatu” at Padej invoke comparisons with burials in extended supine position known from the Danube-Tisza range of the Yamnaya culture and from the northwestern Pontic zone. This analogy is best illustrated by grave 6 from barrow II at Tiszavasvári–Deákhalom (DANI 2011, 27, 28; HORVÁTH *et al.* 2013, 160–162). It can only be surmised that the grave was connected with the oldest phase of a multi-phase mound (DANI 2011, 46, fig. 4). The eastern part of the mound has not been investigated and it cannot be ruled out that this zone contained a grave (possibly: graves) associated with the mound’s enlargement. Like grave 2 from Šajkaš and grave 2 from Padej, grave 6 from Tiszavasvári–Deákhalom had a wooden box construction, with a similar arrangement of floor elements. Clusters of a white, calcareous substance were found at its bottom. The grave cut was also relatively long but narrow. The deceased was lying on the back, in an extended position, with the upper limbs extended along the body. The absolute date of the burial (HORVÁTH *et al.* 2013, 165, Tab. 3) can be estimated, based on two ¹⁴C determinations, to the beginning of the 3rd millennium BC, most likely around 3000-2900 BC (*Table 2*).

Table 2. Radiocarbon datings of extended inhumations from the Danube-Tisza region and of grave 2 from Šajkaš

No.	Site	Feature no.	Dated material	Lab. no.	Age ¹⁴ C BP	Calendar age BC (68.2%)
1	Šajkaš, “Ciganska humka”	2	wood	Poz-88659	4320±60	3014–2889
2			wood	Poz-93936	4385±35	3075–2923
3	Tiszavasvári–Deákhalom	6	human bone	Poz-39209	4350±40	3011–2910
4		6	human bone	Poz-40857	4430±30	3310–2938
5	Vitănești, barrow 2	3	human bone	DeA-12800	4256±30	2907–2877

In terms of the location of burials in the barrow, a situation analogical to Šajkaš was recorded in barrow 2 from Vitănești in Muntenia (LEAHU – TROHANI 1986; reinterpretation: FRÎNCULEASA *et al.* 2017a). A Yamnaya culture grave (no. 2) was dug into the mound of an older barrow exactly above grave no. 3, an extended inhumation placed in a narrow, rectangular pit. The ¹⁴C date obtained for the latter places the calendar age of the burial between 2907 and 2877 BC (Table 2), which means only slightly later than the graves from Šajkaš and Tiszavasvári–Deákhalom.

The stratigraphic arrangement observed in Šajkaš shows the often-recorded pattern of placing a classic Yamnaya culture burial directly above an older grave (WŁODARCZAK 2021b). An identical situation is known, for example, from the Dniester basin in the northwestern Pontic area. It was documented in a barrow at Timkove (OSTROVERKHOV *et al.* 1993; SUBBOTIN *et al.* 2000). An older extended inhumation (grave 5), oriented along the W-E axis, was “superimposed” there on a similarly oriented grave 4, displaying features of the Yamnaya culture (Fig. 6). Significantly, when digging a younger grave, it was rare to destroy an older burial, be it of the Yamnaya culture or some older cultural grouping. The recorded behaviours therefore suggest a desire to continue the funerary foundation and respect the previous burial – regardless of the length of time separating the successive phases of barrow construction.

Several extended inhumations have also been discovered in Bulgaria (ALEXANDROV 2010). None of them revealed traces of wooden constructions which could be used for comparison with the graves from Šajkaš and Tiszavasvári–Deákhalom. However, important chronological arguments can be drawn from barrow III at Goran Slatina (northern Bulgaria), where an older burial in a contracted position on the side was surrounded by a stone circle (feature 9) and then two oval pits with burials in an extended position (features 6 and 7) were dug into it. A later phase is marked in this barrow by graves of the Yamnaya culture (KITOV *et al.* 1991, 62–74). This situation convincingly establishes the chronological position of burials in extended position as being younger than the early graves of the Pre-Yamnaya stage and older than the classic burials of the Yamnaya culture.

The issue of barrow burials in extended position has recently been summarized in several papers (e.g. ALEXANDROV 2010; MANZURA 2010; IVANOVA 2013; RASSAMAKIN 2013a; FRÎNCULEASA *et al.* 2017a). In these works – following the suggestion of Y. Rassamakin – they are often referred to as the “Kvitiana type” instead of the formerly used name of “burials of post-Mariupol type”. However, this new nomenclature can be confusing when applied to rituals that show considerable variation over time. The tradition of burials in an extended position has a considerable time depth and might have been shared by different cultural groups. This fact has been highlighted by researchers studying the northwestern Pontic zone (e.g. IVANOVA 2015, 280–282). In the context of absolute dating of extended inhumations from the Danube-Tisza zone, it is difficult to link these graves to the Kvitiana type, which represents a clearly older phenomenon (from the first half of the 4th millennium BC).

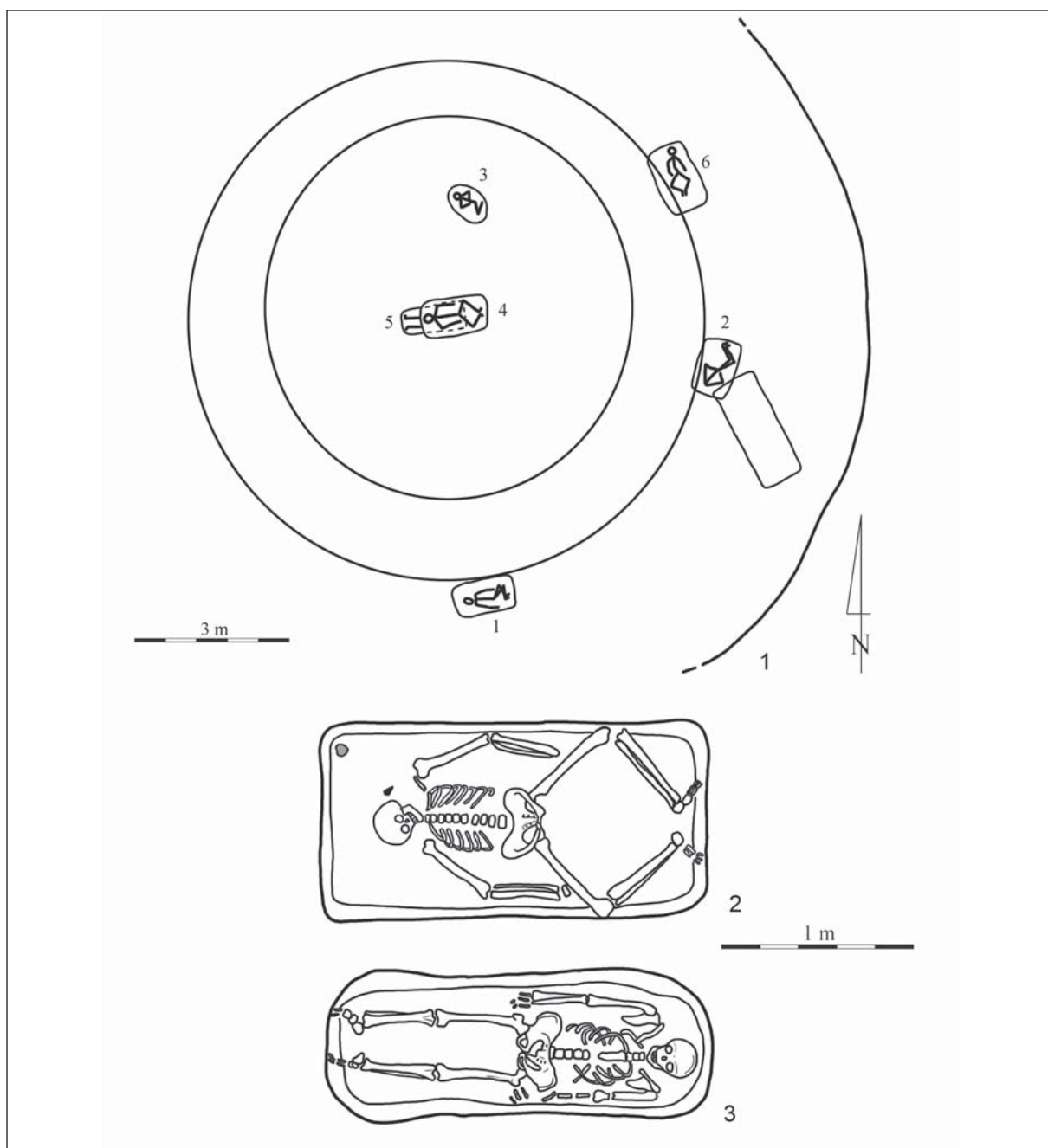


Fig. 6. Timkove, middle Dniester region (Ukraine). 1 – plan of barrow, 2 – grave no. 4, 3 – grave no. 5.
(after OSTROVERKHOV et al. 1993, modified)

The chronological position of the extended burials discussed here is clarified by stratigraphic arrangements recorded in the barrows in which, apart from these burials, graves of the Zhivotilovka-Volchansk group and the Yamnaya culture were also discovered. The study of a barrow at Bursuceni on the Reut River (Moldova, Middle Dniester Basin; YAROVY 1979) provided important information in this regard. Its oldest phase is associated with burials of the Zhivotilovka-Volchansk group (YAROVY 2019). Subsequently, two graves with extended inhumations were dug into the mound of the Eneolithic barrow, followed by burials linked with the older phase of the Yamnaya culture (MANZURA 2016). A

similar stratigraphic pattern was also recorded in barrows from Northern Moldavia, at Corlateni (COMȘA 1982) and Shcherbaki (LARINA 1989, 71–75). The situations from these sites clearly document the chronological position of extended inhumations close to the horizon of the early Yamnaya culture.

From the above observations, it is possible to include extended burials into the early Yamnaya horizon, dated around 3100/3000–2900 BC. This assumption is supported both by stratigraphic situations in the barrows and by similarities in grave structures and burial arrangements. Therefore, grave 2 from Šajkaš, as well as graves 1 and 2 from Padej, has been included in the older phase of the Yamnaya culture in Vojvodina.

7. Yamnaya culture ritual

The list of Yamnaya culture burials from Vojvodina still remains relatively short (*Table 3*), and much of the data is incomplete, due either to documentation deficiencies or to only partial examination of barrows. As a result, difficulties sometimes arise in establishing the stratigraphic position of uncovered graves and in confidently identifying central or secondary burials. In this connection, the results from the recently studied barrows from Šajkaš and Žabalj, located in the territory of Bačka, play a special role. This is because the data coming from there are complete and concern entirely explored and relatively well-preserved mounds. However, considering the number of barrows known from Vojvodina and taking into account their varying sizes, any inferences about the completeness of the state of knowledge should be made with caution. The cultural attribution of large mounds measuring over 5 m in height is still a puzzle which needs to be unlocked. The only clues in this regard were provided by test trenches cutting through barrows of this type, made in Padej (“Humka u Barnahatu”) and in Srpski Krstur (“Slatinska humka”). In the first case, two phases associated with two burials of the older phase of the Yamnaya culture were identified (GIRIĆ 1987). In “Slatinska humka”, no Yamnaya culture burial was discovered. Instead, only an amphora with cord decoration was found in the context of traces of cremation. Based on typological assessment, this vessel was correlated with the Baden-Coțofeni horizon, i.e. with the Pre-Yamnaya phase (e.g. BULATOVIĆ 2014, 121; KOLEDIN *et al.* 2020, 362), although its style also reveals references to the pottery of steppe communities of the late 4th millennium BC.

Table 3. Characteristics of inhumation graves from Vojvodina

Site, grave no.	Orientation of the deceased	General position of the body (B – on the back, crouched legs)	Upper limbs (acc. HÄUSLER 1974, 11, Abb. 1)	Dimensions of pit [cm]	Depth of pit [cm]	Sex, age	Ocher	Mat on the bottom	Wooden covering	Wooden sticks	Equipment
Jabuka-Tri humke	W-E	B	B	150 × 90		♂, 40-60 years	-			-	-
Jaša Tomić, “Velika humka”	N-S?	?	?	?		?	-	-	-	-	-
Mokrin, “Arađanska humka”	W-E	?	D	?		?	-	-	-	-	-
Novi Kneževac, “Japina koliba”	W-E	B	F	150 × 100	50	?, adult	+	+	+	+	-
Padej, “Humka u Barnahatu”, grave 1	W-E	B		210 × 75	0	♂, adult	+	+	+	-	

Site, grave no.	Orientation of the deceased	General position of the body (B – on the back, crouched legs)	Upper limbs (acc. HÄUSLER 1974, 11, Abb. 1)	Dimensions of pit [cm]	Depth of pit [cm]	Sex, age	Ocher	Mat on the bottom	Wooden covering	Wooden sticks	Equipment
Padej, “Humka u Barnahatu”, grave 2	W-E	B		230 × 80		?, adult	+	+	+	-	
Pančevo-Livade, grave 80	SW-NE	B	C	140 × 80		?, 13-15 years	+	-	-	+	silver hair-rings?
Perlez-Batka C, “Pašićeva humka”, grave 1	?	B	?	?		Infans I		+		+	-
Perlez-Batka C, “Pašićeva humka”, grave 6	SW-NE	B	C	190 × 85	60	♂, >60 years	+	+	+	-	-
Perlez-Vuna, barrow 9, grave 1	W-E	B	C	160 × 90	125	♂, ≤40 years	+	+	+	-	-
Perlez-Vuna, barrow 10, grave 3	W-E	B	B	155 × 95	60	♂, ca. 50 years	+	+	+	-	-
Šajkaš, “Ciganska humka”, grave 1	SW-NE	B	A	220 × 120		♀, >40 years	+	+	+	-	-
Uljma, “Itebejčeva humka”	W-E	?		190 × 150		?, 10-13 years	+		+	-	three gold ornaments
Vlajkovac, “Straža”	?	B	F?	?		?	+	+	+	-	-
Vojlovica, Rafinerija nafte	SW-NE	B	I	175 × 90	80	♀, >40 years	+	+	+	+	two silver ornaments
Žabalj, “Medisova humka”, grave 1	W-E	B	I	190 × 110		♂, >40 years	+	+	+	+	-
Žabalj, “Medisova humka”, grave 4	-	-	-	160 × 80		♂, >40 years	+	+	+	+	-

The barrows from Mokrin and Srpski Krstur point to two possibilities: (1) extension of mounds connected with older cultural groups, or (2) gradual enlargement of Yamnaya barrows with the digging of subsequent graves. One can only speculate that the large size of the barrows always linked with the ritual of the Yamnaya culture and resulted from a considerable, sometimes repeated, extension of older mounds. The cultural attribution of smaller barrows (less than 30 m in diameter) does not seem so straightforward; structures of such size were typical of funerary rituals of the 4th millennium BC, as well as of the single-phase funeral complexes of the Yamnaya culture of the 3rd millennium BC (e.g. barrows 9 and 10 from Perlez-Vuna or the barrow from Vojlovica).

The primary grave was usually located under the central part of the mound. Often, it was in this zone that subsequent burials were placed as well, associated with later episodes of barrow extension, as in the case of “Ciganska humka” at Šajkaš. The extended mound maintained the same centre. Less frequently, as in “Medisova humka” at Žabalj, a younger burial was established on the edge of an older barrow, and during the enlargement the position of the centre of the whole complex shifted. In none of the barrows from Vojvodina examined so far have more than two graves been discovered. This means that complex, multiphase funerary arrangements in the type known from the northwestern Pontic zone do not occur here. It is worth mentioning that barrows with numerous burials dated to the first half of the 3rd millennium BC are lacking throughout the Pannonian Plain in general. In several cases it has been demonstrated that mounds of large sizes were associated with no more than two or three

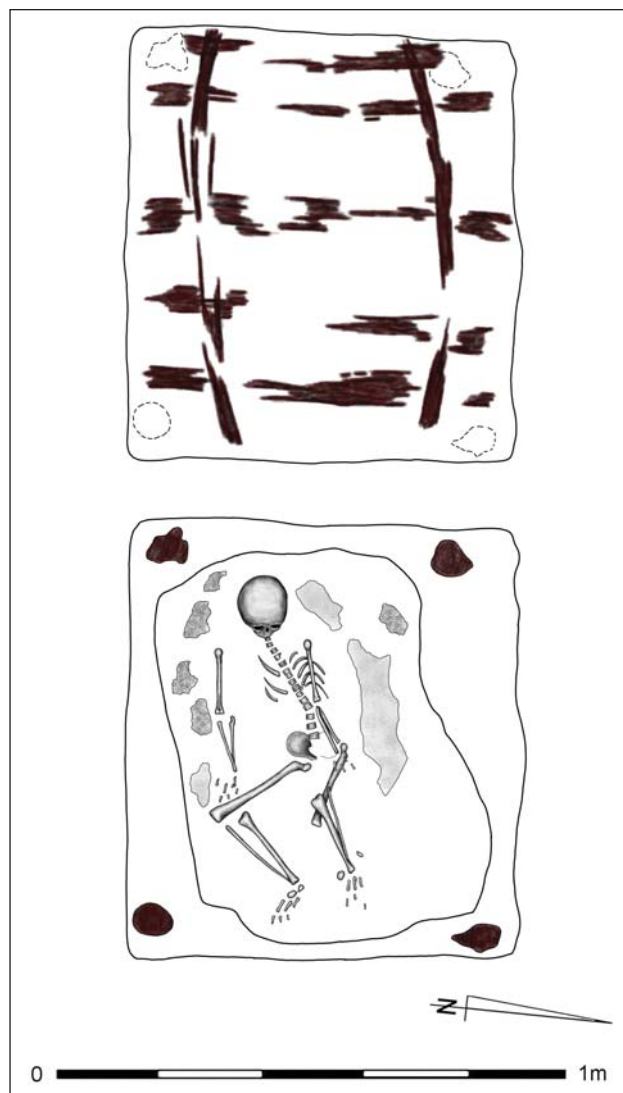


Fig. 7. Novi Kneževac, “Japina koliba”, grave 1.
Drawing by Michał Podsiadło
(based on documentation of M. Girić stored
in National Museum Kikinda)

roofs usually consisted of numerous elements, oriented according to the longer (Padej, Vojlovica) or shorter side of the burial chamber (Žabalj, grave 1; possibly also Uljma and Šajkaš, grave 1). In the case of central tombs or burials associated with the extension of a barrow, roofing structures could cover a large area, extending well beyond the limits of the grave cut (Vojlovica: 4×1.6 m, Žabalj, grave 1: 3.6×2.9 m). In grave 1 at Žabalj, the presence of a mat sealing the roof was recorded (JAROSZ *et al.* 2021; figs 29 and 30), a solution which finds analogies among burials from the northwestern Pontic area (WŁODARCZAK 2017, 270, fig. 15).

The presence of different types of organic materials lining the bottom of the grave should be considered a characteristic feature of the funerary rites of the Yamnaya culture (HEYD 2011, 540) Nevertheless, the manner of preparing the bottom before burial shows regional variability (KAISER – WINGER 2015,

phases of extension. For example, the “Törökhalom” barrow from Kétegyháza, measuring 7 m in height, was created in connection with establishing only three burials (a fourth grave was dug into it without enlarging the mound; ECSÉDY 1979, 24, fig. 14). It is possible that the barrow of “Humka u Barnahatu” in Padej gained its comparably large size only after one extension (in connection with the digging of grave 2: GIRIĆ 1987).

The grave construction and the manner in which Yamnaya culture burial was arranged in grave are features that show standardization throughout the Danube-Tisza zone, and find very good parallels in the North Pontic area (cf. RASSAMAKIN 2013b, 127–130). Thus, individual elements of ritual find very close analogies in both nearby and distant areas, meaning that funeral practices followed rules that were universal and only slightly influenced by local cultural traditions. Local specificity can only be seen in the frequency of certain ritual features, such as the use of stone elements in the construction of roofs or wooden stakes at the bottom of the grave.

A ritual element typical of the Yamnaya culture is the use of wood for the roofs of burial chambers. It was also documented frequently in barrows from Vojvodina (Figs 7 and 8). The few sites where no traces of such constructions have been noticed (Jabuka-Tri humke; Pančevo-Livade) are intriguing. It is difficult to say whether they are evidence of a departure from the guiding principle of the Yamnaya culture’s funerary rites, which was to deposit the deceased in an empty chamber. Wooden

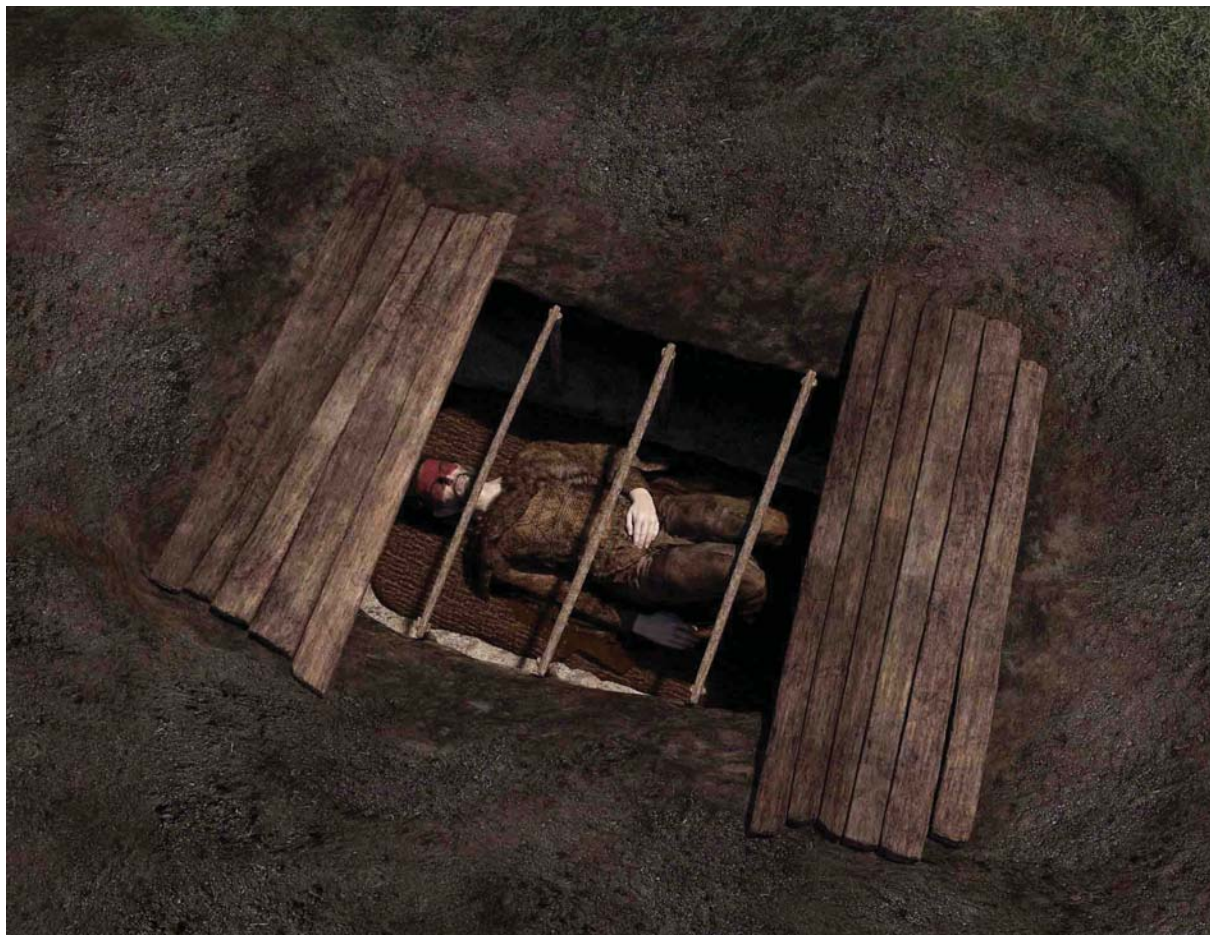


Fig. 8. Reconstruction of grave 1 from “Medisova humka” at Žabalj. By M. Podsiadlo

124). Rectangular mats made of plant materials, as in graves 1 and 4 from Žabalj (Fig. 9), have wide distribution (JAROSZ *et al.* 2021, figs 25, 26 and 34). Analogous mats come from other regions of the Danube-Tisza zone and from the northwestern Pontic. Specialist analyses showed that these were plaited from reed (KALUŽNA-CZAPLIŃSKA *et al.* 2017). We can only assume – based on the information provided by authors of respective studies – that floor coverings from the graves in Novi Kneževac, Vojlovica, and Vlajkovac were also of a similar nature. In the grave from Vlajkovac, herringbone decoration was found on the mat (MILLEKER 1906, 195). This observation has recently gained confirmation in the discovery of decorations made with red dye on the floor linings in two graves: at Žabalj (grave 4: JAROSZ *et al.* 2021, fig. 24: 1) and at Malomirovo in eastern Thrace.²

A specific feature recorded in some of the analysed graves is the presence of wooden structures at the bottom of them. They were recorded in graves 1 and 2 in Padej, grave 2 from Šajkaš, and also in Perlez-Vuna.³ Traces of such structures were also documented in the barrow of Bucova Pusta IV at Dudeştii Vechi in the Romanian Banat (KRAUSS *et al.* 2016, 299, Abb. 6). This feature has been noted in barrows from Hungary as well, with examples including Szentes-Besenyőrhalm (HEGEDŰS 1978,

² Research carried out by a Polish-Bulgarian expedition in 2021.

³ The presence of wood at the bottom of the graves from barrows 9 and 10 at Perlez-Vuna is not mentioned in the publication (MEDOVIĆ 1987). However, it is recorded in the excavation reports kept in the archives of the Museum of Vojvodina in Novi Sad.



Fig. 9. Žabalj, “Medisova humka”. Part of grave 1 with a clearly visible mat. Photo by Michał Podsiadło

34, Abb. 8) and Kétegyháza–Kétegyházi tanyák (ECSEDY 1979, 22, fig. 10). The state of preservation of the wood often makes it impossible to tell whether these were bottom linings or carrier-type structures (biers), as in the case of the spectacular burials from Taraclia in Moldovan Budzhak (SAVA *et al.* 2019, 255, 256, figs 26: 7 and 27: 4). A characteristic element of these wooden structures were short beams/boards placed at the edges of the pit transverse to its longer axis (Padej, graves 1 and 2; Šajkaš, grave 2). They were also recorded in several sites from southern Hungary, e.g. at Kétegyháza–Kétegyházi tanyák, barrow 3, graves 4 and 6 (ECSEDY 1979, 21, fig. 9; 22, fig. 10) and at Tiszavasvári–Deákhalom, barrow II, grave 6 (DANI 2011, 50, fig. 8). Compared to areas further to the east, there is a tendency in the Pannonian Plain to a specific finishing of the burial chamber by lining its bottom with wood.

The analysis of the manner of deposition of the body of the deceased provides interesting results. This element of funerary ritual received considerable attention in the past, emphasising its importance for conclusions concerning the taxonomy and chronometry of barrow funerary complexes (e.g. HÄUSLER 1974; 1976; YAROVY 1985; DERGACHEV 1986; RASSAMAKIN 2004). In recent years, the concept of chronological sequences regarding the manner in which the deceased was laid out has been successfully applied to analyses of the funerary ritual of the Yamnaya culture, among others for a complex of cemeteries in the vicinity of Yampil on the middle Dniester (WŁODARCZAK 2017) and for the “Movila Mare” barrow at Smeeni in Muntenia (FRÎNCULEASA *et al.* 2017b). In both of these cases a similar sequence was recorded: burials with the upper limbs erect and extended along the torso were typical of the older phase, while burials with one limb (rarely two) flexed characterized the younger phase. Moreover, for the northwestern Pontic and the Danube-Tisza areas, when burials representing these two types of body alignment were present in a barrow, the former always occupied an older chronological position. This relatively simple scheme, however, may be disturbed by a possibility that older traditions from the 4th millennium BC (“Eneolithic”, in the terminology used for the northwestern Pontic zone) survived in the burial rite of the 4th millennium BC. It is for the North Pontic zone that the ritual of the

Yamnaya culture has been demonstrated to not only include features of neighbouring cultures, but also elements derived from older traditions, such as “Kvitiana” or “Nizhnaya Mikhailovka” (IVANOVA 2015). In reconstructing the evolution of funerary rites in the Yamnaya community, therefore, we should not expect to see chronologically distinct stages with clear boundaries, but rather trends intensifying over time, developing in parallel with surviving older traditions.

With regard to Vojvodina, it is worth noting the presence of burials with both limbs strongly flexed at the elbow joint, as in the case of three burials from Perlez (Vuna and Batka C, *Fig. 10.2–4*), Šajkaš (grave 1), or the burial from Pančevo-Livade (*Table 3*). Such a body arrangement seems to indicate a relatively late chronological position, and furthermore finds an analogy in the rituals of the Corded Ware culture (WŁODARCZAK 2017, 256, 257). Similar arrangements of upper limbs are known throughout the Pannonian Plain (e.g. DANI 2011, 45, fig. 3: 1, 3; ECSÉDY 1979, 33, fig. 25), which means they can be regarded as characteristic of the western range of the Yamnaya culture.

Known as type I, the pattern of upper limb arrangement recorded in burials from Vojlovica (*Fig. 11.2*) and Žabalj (grave 1: *Fig. 8*) is particularly characteristic of younger Yamnaya rituals in many regions. In this case, one limb is slightly bent and placed at the pelvis. The small dataset from Vojvodina suggests that this arrangement is younger than the variant with both limbs erect, characteristic of the older phase of the Yamnaya culture. At the same time, it is typologically older than the arrangements with limbs strongly flexed described above.

In all cases recorded to date, the lower limbs of the deceased were slightly bent, so that the body arrangement may be described as a “contracted position”. However, there are clear differences in the

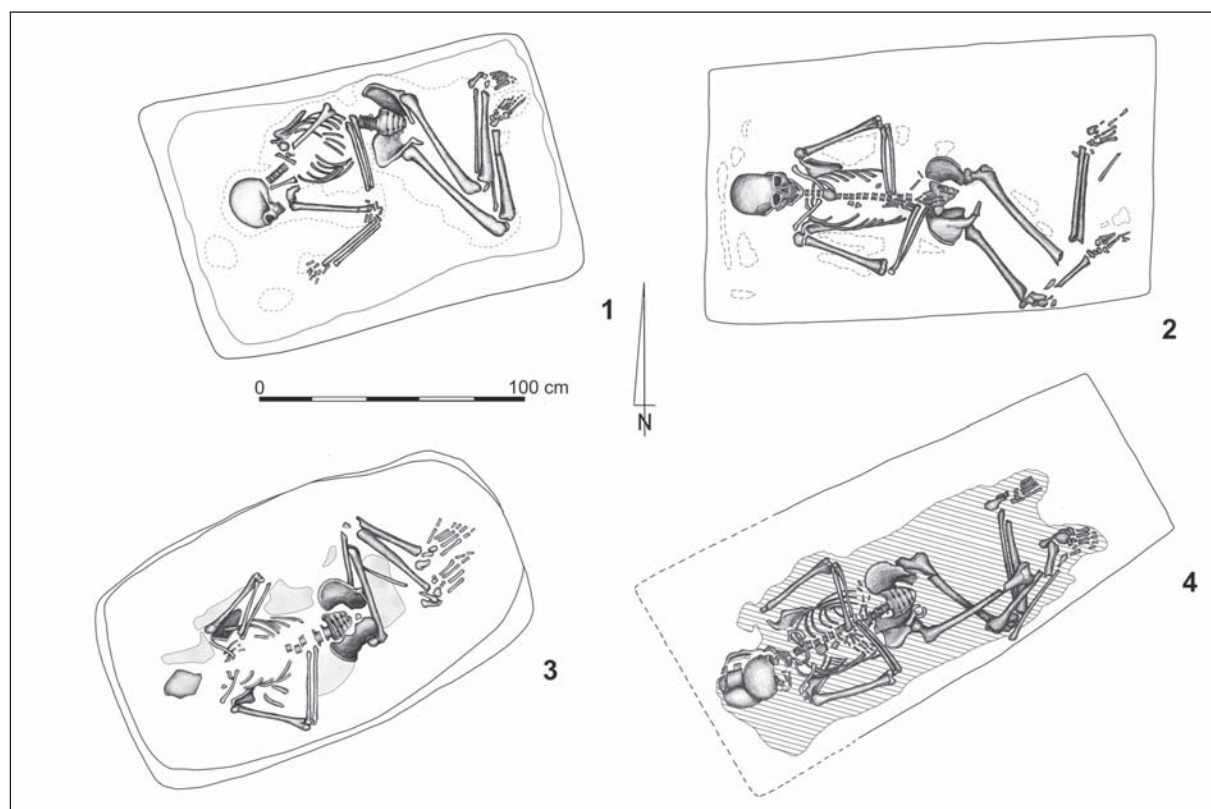


Fig. 10. Examples of primary burials from southern (1) and central Banat (2–4). 1 – Jabuka, “Tri humke”, grave 1 (from the archive of the museum in Vršac), 2 – Perlez-Vuna, kurgan 9, 3 – Perlez-Vuna, kurgan 10, 4 – Perlez, “Pašićeva humka” (after MEDOVIĆ 1987, modified)

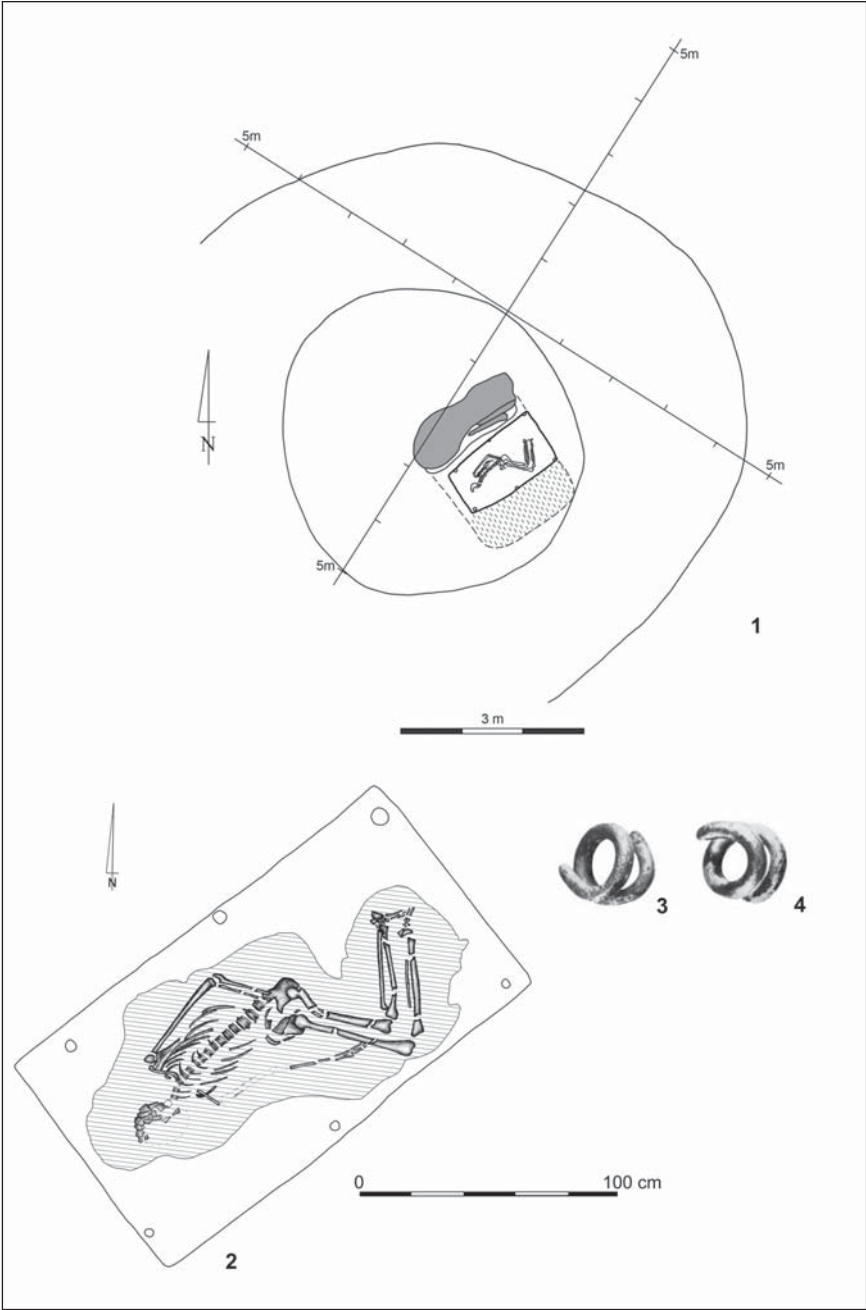


Fig. 11. *Vojlovica-Rafinerija nafte*. 1 – general plan of the barrow, 2 – grave 1 (central burial).
3, 4 – silver hair-rings (after JOVANOVIĆ 1974a, modified)

degree of limb bending. The majority of burials are strongly contracted at both the hip and knee joints. Only graves 1 and 2 from Padej (“Humka u Barnahatu”) discussed above represented an arrangement with the limbs only slightly contracted, with the knees pointing outwards (the so-called “frog position”). The burial from Vojlovica was also characterized by a slightly less bent limbs. Thus, based on the limited data, it seems that the degree varied over time: in the older phase, burials with slightly bent limbs occur, known as “relaxed Hocker” and characteristic of the Pre-Yamnaya period as well. In the younger phase (after about 2900 BC), the pattern with limbs strongly contracted at both joints prevailed.

A similar change can be noticed at this time in Central Europe, in the rituals of Beaker cultures (Corded Ware and later Bell Beaker culture).

There is abundant evidence for the strict observance in western Yamnaya culture of the principle of orientating the deceased in the primary grave along the W-E axis, with the head facing W. This principle is also maintained in the Vojvodina burials (*Table 3*), although in a few cases clear deviations towards the SW-NE can be seen. This rule has also been linked in the literature to the male gender of the buried, as indicated by anthropological analyses in many cases (e.g. HEYD 2011, 539; WŁODARCZAK 2017). This found an analogy in the barrow ritual of the older phase of the Corded Ware culture, where men were usually buried on the right side and oriented along the W-E axis, head to W (WŁODARCZAK 2000; 2014, 12–17). Nevertheless, there were also isolated cases of female burials, a well-established example being the central grave from Bojt–Tökös Varga (DANI *et al.* 2017, 147, fig. 11). The results of aDNA analyses of skeletons from Vojvodina indicate that in the “Ciganska humka” barrow in Šajkaš (grave 1) and in Vojlovica-Rafinerija nafta the burials in the centre of the barrow also belonged to women (NOVAK 2021). It is worth mentioning in this context that a burial described as belonging to a girl aged 10–13 years was also discovered in the barrow from Uljma, investigated at the beginning of the 20th century (cf. DANI 2021). In light of these findings, it cannot be ruled out that the burial of an individual aged 13–15 years from Pančevo-Livade, characterized by their delicate build, could also have been female (ĐORĐEVIĆ – ĐORĐEVIĆ 2016). A grave from the central part of the Bucova Pusta IV barrow at Dudeștii Vechi in the Romanian part of northern Banat has been identified as the burial of an older woman (KRAUSS *et al.* 2016, 300, 301). These findings indicate that the number of female burials in central graves has hitherto been underestimated. This is due, among other things, to the fact that the communities of the Yamnaya culture used similar rituals for the dead of both sexes: laying them on their backs with the upper limbs contracted, orienting their heads to the west, and furnishing them with similar objects (mainly metal hair-rings).

Among the finds from Vojvodina, a slightly different pattern of funerary ritual is represented by the burial from the barrow at Jabuka-Tri humke in southern Banat (BUKVIĆ 1982). In a chamber of typical dimensions, the deceased was found lying in a semi-supine position, with a pronounced tilt to the right side. The upper limbs were strongly bent at the elbows and placed with the hands toward the head. No ochre was discovered on the bones or at the bottom of the pit, and no wooden structural elements were present. In terms of ritual features, the presence of older local Eneolithic traditions can be indicated here. The relatively late radiocarbon dating of this grave points to a time horizon that undoubtedly coincides with the Yamnaya culture. Furthermore, the parameters of the mound, the shape and size of the burial chamber, and the orientation of the burial all find analogies in the barrow ritual of that culture. The deviations from “standard” ritual indicated above most likely attest to genetic variation within the Yamnaya community and survival of older, Eneolithic traditions. Similar observations apply to the finds from northwestern Pontic area, where a small number of burials partly referring to older traditions are present alongside “classic” graves (e.g. IVANOVA 2015). An example of a burial arrangement identical to that recorded at Jabuka is the central grave from the barrow at Vetrino in northeastern Bulgaria, also without clear signs of ochre use (BOZKOVA – TONKOVA 2020, 452, fig. 4).

Another, even more marked departure from the dominant pattern is the secondary and incomplete inhumation burial from grave 4 at Žabalj (JAROSZ *et al.* 2021, fig. 23). Its nature contradicts the main ritual imperative of the Yamnaya culture, prescribing burial in the appropriate position and with the established orientation of the body. The burial from Žabalj, on the other hand, is an example of depositing decomposed and incomplete remains in a grave. It should be noted that such a ritual, as well as other behaviours leading to the disruption of the original burial layout, have been known for many areas within the Yamnaya range, northwestern Pontic zone in particular (AGULNIKOV – POPOVICH 2010). It

rarely appears in the western range of the Yamnaya culture as well (ILIEV – BAKĀRDŽIEV 2020, 177, Taf. 53: 1, 2).

The use of ochre in funerary rituals is a differentiating feature of burials from Vojvodina. There are a few sites where either no traces of red pigment (e.g. Jabuka) or only trace amounts of it have been recorded (e.g. Žabalj, grave 1). In most cases, the presence of ochre is confirmed – usually on the bones of the burials, sometimes also in the form of lumps deposited at the height of the head of the deceased (Pančevo-Livade, grave 80), that is, in a manner characteristic of the Yamnaya ritual.

The furnishings of Yamnaya culture graves from Vojvodina are limited to two, sometimes three sets of metal hair-rings (the inventory reconstructed for the grave from Pančevo-Livade is uncertain: ĐORĐEVIĆ – ĐORĐEVIĆ 2016, 21). Two silver hair-rings were discovered in the female burial from Vojlovica, while three gold ornaments were found by the *Iuvenis* aged individual discovered at Uljma. It is possible that this was a female burial as well (DANI 2021).

Two artefacts from Vojlovica, made of thick copper wire, represent a type of ornament characteristic of the Yamnaya culture (Fig. 11.3, 4). Their similarity to artefacts from Romania (see hair-ring from Ariceştii-Rahtivani; FRÎNCULEASA *et al.* 2015, 96, pl. 2: 2) suggests they were silver plated (CHIOJDEANU *et al.* 2011; FRÎNCULEASA *et al.* 2019b). In S. Alexandrov's classification, referring to materials from northern Bulgaria, these artefacts should be included in variant IA1 (ALEXANDROV 2009, 7). This variant groups "massive" hair-rings, known from various regions including northwestern Pontic area (e.g. DERGACHEV 1986, 56), although they remain unique discoveries in the Pannonian Plain. The Vojlovica hair-rings reflect a "fashion for silver" among barrow communities in the first half of the 3rd millennium BC (VANGORODSKA 1987; IVANOVA 2007).

The linking of three gold objects to the inventory of the grave from Uljma explored in the early 20th century is a surprising discovery made in recent years at the Timișoara museum (DANI 2021). Two small ornaments are crescentic hair-rings – one of the typical objects found in barrows from the late 4th and the first half of the 3rd millennium BC (DANI 2021, figs 6 and 7). They can be classed as the Zimnicea type, which is close also to the Leukas type. These forms can be called "Balkan", in contrast to the more common, simple hair-rings, probably adopted from the North Pontic zone. The third of the gold objects from Uljma – a spiral lock-ring of four coils – is a rare form in the context of barrow burials from the first half of the 3rd millennium BC (DANI 2021, fig. 5), although having some good analogies there: in Bulgaria and Transylvania (cf. DANI 2021, examples there).

8. Absolute chronology

The newly obtained series of radiocarbon dates (Table 4; Figs 12 and 13) allows the absolute chronology of the Vojvodina barrows to be refined. For many years the possibility of dating them was limited to the interpretation of the result obtained in the Berlin laboratory for grave 2 from "Humka u Barnahatu" at Padej (GIRIĆ 1987, 73). Another 13 dates were obtained for graves discovered during new research in Bačka (8 results) and for graves from Banat known from the literature (5 results). All results point to the first half of the 3rd millennium BC (Fig. 12), but two groups of dates stand out (Fig. 13). The older one (group 1) consists of the results for grave 2 from Padej, the central burial from Vojlovica and a series of determinations for grave 2 from Šajkaš and the mound layer connected with it. The younger group (group 2) comprises of the dates obtained for burials from Jabuka, Pančevo-Livade (grave 80), Perlez-Vuna (barrows 9 and 10), Šajkaš (grave 1), and Žabalj (graves 1 and 4). These two groups correspond respectively to the early and classic stages of the Yamnaya culture in the Danube-Tisza zone and in the northwestern Pontic area. Their identification is largely determined by the nature of the calibration curve (Fig. 13). In the period

analysed here, it runs steeply for the very beginning of the 3rd millennium BC and follows into an extensive plateau for the years around 2880–2580 BC. Consequently, the calendar age ranges obtained for the older group of dates are exceptionally precise, while those for the younger group are very wide. This situation also results in the impression of a clear temporal separation between the older and the younger group. In fact, the temporal distance separating, say, the graves from Vojlovica on the one hand and Perlez-Vuna or Šajkaš (grave 1) on the other may have been small, corresponding to no more than one or two generations.

Table 4. List of radiocarbon dating obtained for the Vojvodina barrows

No.	Site	Feature no.	Dated material	Lab. no.	Age ¹⁴ C BP	Calendar age BC (68.2%)
1	Padej, “Humka u Barnahatu”	2	wood	BlN-2219	4320±50	3011–2891
2	Jabuka-Tri humke	1	human bone	Poz-93213	4100±40	2848–2577
3	Pančevo-Livade, grave 80	12	human bone	Poz-81208	4050±40	2629–2488
4	Perlez-Vuna, barrow 9	1	human bone	Poz-114161	4190±35	2883–2700
5	Perlez-Vuna, barrow 10	3	human bone	Poz-114162	4175±35	2879–2680
6	Šajkaš, “Ciganska humka”	1	wood	Poz-88657	4170±40	2877–2676
7	Šajkaš, “Ciganska humka”	1	human bone	Poz-88664	4195±35	2885–2701
8	Šajkaš, “Ciganska humka”	2	wood	Poz-88659	4320±60	3014–2889
9	Šajkaš, “Ciganska humka”	2	wood	Poz-93936	4385±35	3075–2923
10	Šajkaš, “Ciganska humka”	-	animal bone	Poz-114159	4335±35	3011–2901
11	Šajkaš, “Ciganska humka”	-	animal bone	Poz-114160	4325±35	3010–2894
12	Vojlovica, “Rafineria nafte”	1	human bone	Poz-88701	4290±35	2920–2884
13	Žabalj, “Medisova humka”	1	human bone	Poz-100501	4125±35	2858–2625
14	Žabalj, “Medisova humka”	4	human bone	Poz-100500	4130±30	2857–2629

The two groups of dates correspond to the ranges distinguished in the general models developed for the chronology of barrows in the western part European steppes (HORVÁTH *et al.* 2013, 169–173; FRÎNCULEASA *et al.* 2017b, 121–133; DIACONESCU 2021, 25, 26). Moreover, the results of the ¹⁴C analyses coincide with the typological assessment of the finds presented above. Assigned to the older phase of the Yamnaya culture, the graves from Padej (grave 2) and Šajkaš (grave 2) are dated similarly: between ca. 3000–2900 BC. In contrast, the slightly younger Vojlovica burial corresponds in most respects to the “classic” finds, dated to a younger time period (ca. 2850–2600 BC). The absolute age range obtained for this burial, characterized by relatively high precision (2920–2884 BC with 68.3% probability), is only slightly older than the ranges established for the earliest graves of group 2 (2885–2701 BC for grave 1 from Šajkaš). Considering the single dating from Vojlovica as representative, the beginning of the younger/“classic” phase of the Yamnaya culture should be slightly shifted back in time. Then, a sequential model can be proposed which is based on the typological difference between the graves, assuming an older age for grave 2 from Šajkaš and grave 2 from Padej (corresponding to the early Yamnaya phase) and a younger age for grave 1 from Vojlovica (already associated with the younger phase). The older range would then fall to about 3006–2907 BC, and the younger range would be 2917–2888 BC (*Fig. 14*). Although these are only single age determinations, the chronological model built from them looks plausible: the transition between the older and younger phases of the Yamnaya culture is reliably dated to around 2900 BC.

The chronometric data obtained for the Vojvodina barrows are well synchronized with radiocarbon dates from other parts of the Pannonian Plain. For the Romanian part of Banat, ¹⁴C dates are available for two sites: Dudeștii Vechi-Bucova Pusta IV (KRAUSS *et al.* 2016, 302) and Silvașu de Jos-Dealul

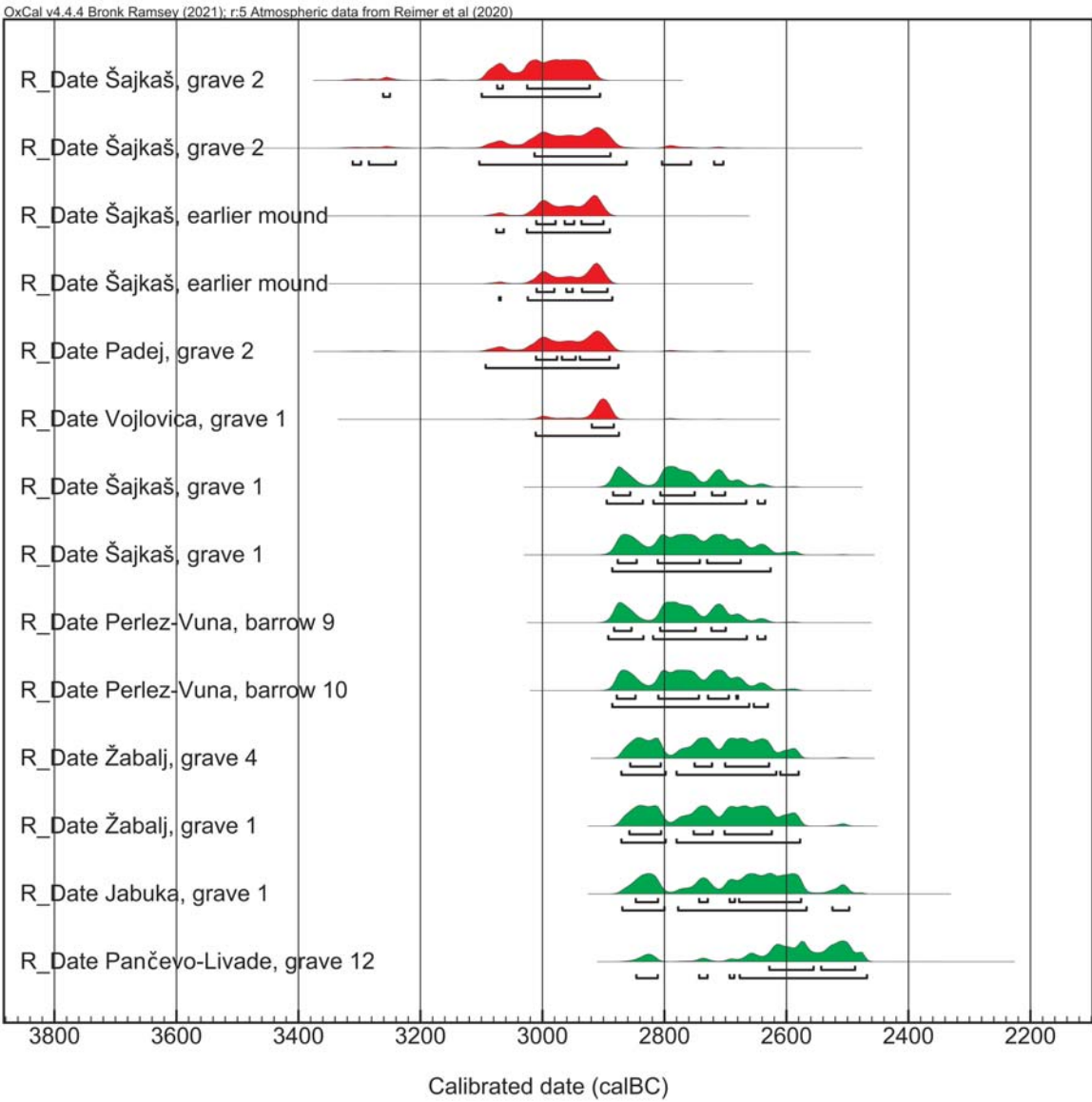


Fig. 12. Radiocarbon datings of barrows from Vojvodina (red – early phase, green – younger phase)

Țapului (notably: LUCA *et al.* 2012; DIACONESCU – TINCU 2016; DIACONESCU 2021; see also *Table 5*). The data for the latter site are particularly important because of the stratigraphic position of the Yamnaya culture graves documented there, which are younger than the cremation burials of the Coțofeni culture. The types of construction and manners of body deposition in Yamnaya culture burials from Silvașu de Jos have good counterparts in materials from Bačka and the Serbian Banat forming the younger group of finds (group 2). Of great importance is the clarification of the absolute age by making four ¹⁴C determinations (two from bone and two from charcoal) for grave 1/2010. This allows this grave to be placed within the range of ca. 2800–2600 BC.

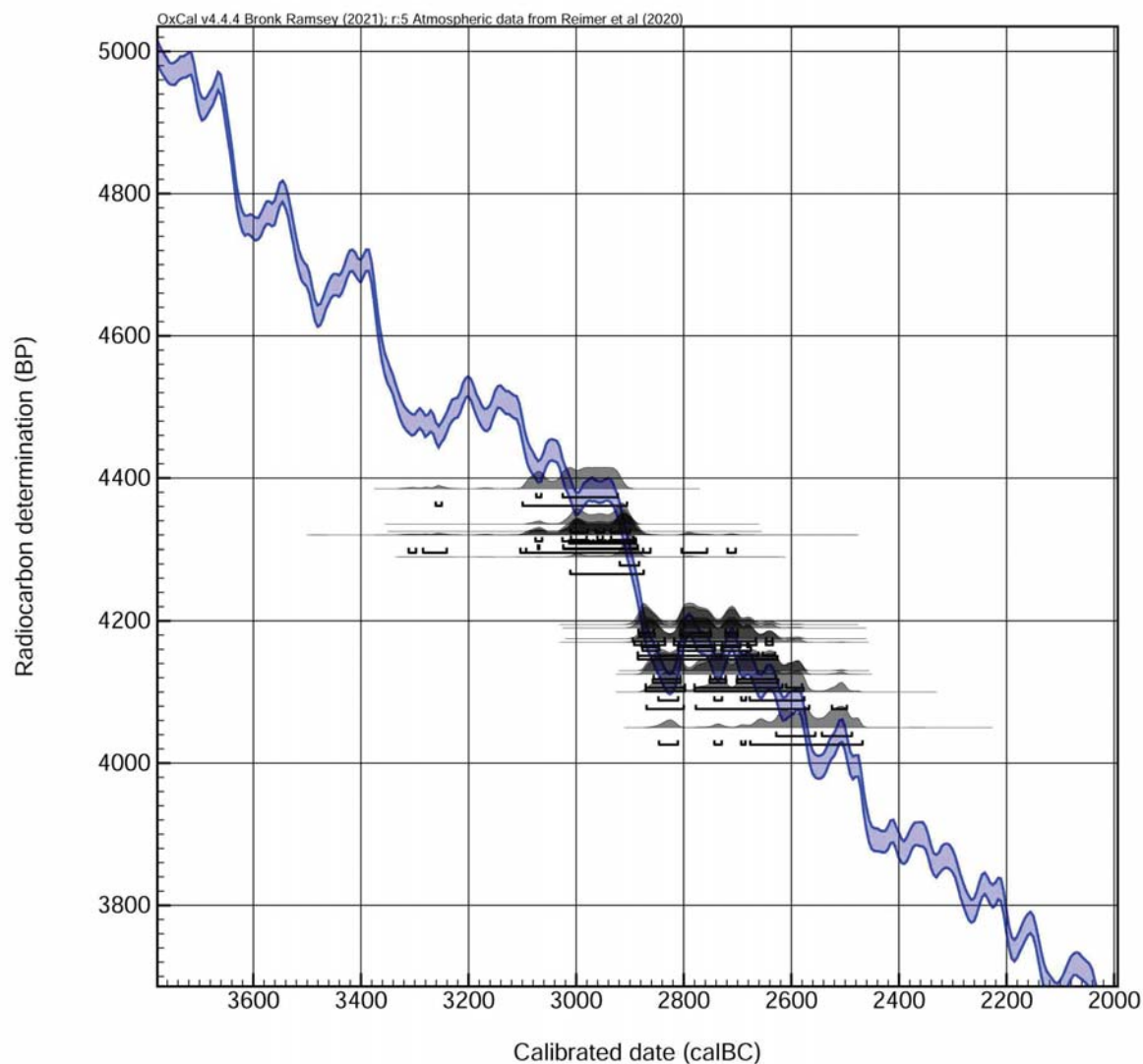


Fig. 13. Radiocarbon dates of Yamnaya barrows from Vojvodina (see Table 3) on calibration curve

Table 5. Radiocarbon datings of Yamnaya graves from Romanian part of Banat

No.	Site	Grave no.	Dated material	Lab. no.	Age ¹⁴ C BP	Calendar age BC (68.2%)
1	Dudeștii Vechi, “Bucova Pusta IV”	1	Human bone	Poz-66988	4190±35	2883–2700
2	Silvașu de Jos – Dealu Țapului, barrow 3	1/2015	Human bone	Poz-78170	4130±35	2860–2627
3	Silvașu de Jos – Dealu Țapului, barrow 4	1/2010	Charcoal	Poz-56765	4135±35	2862–2630
4	Silvașu de Jos – Dealu Țapului, barrow 4	1/2010	Human bone	Poz-53778	4115±30	2850–2585
5	Silvașu de Jos – Dealu Țapului, barrow 4	1/2010	Human bone	RoAMS 5C	4104±25	2843–2581
6	Silvașu de Jos – Dealu Țapului, barrow 4	1/2010	Charcoal	RoAMS 5E	4147±31	2868–2638

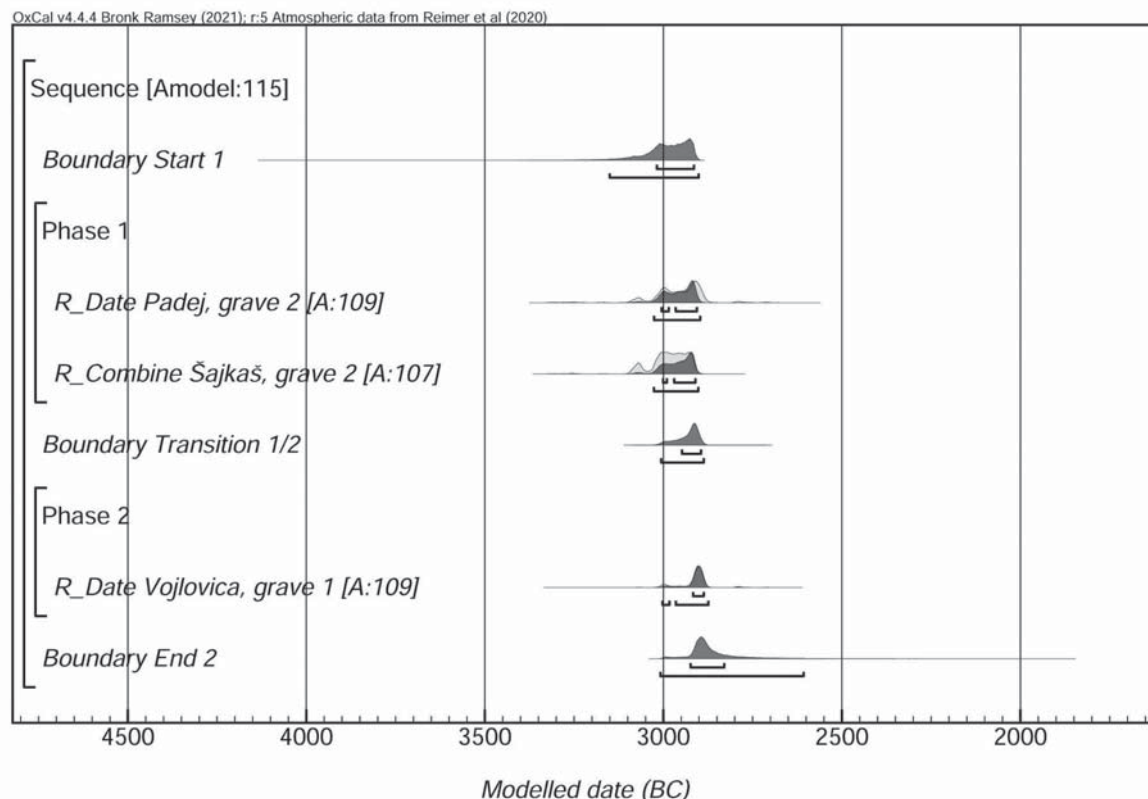


Fig. 14. Model assuming a sequence of two stages of the early Yamnaya phase

A series of radiocarbon dates is also available for Yamnaya culture graves from the Hungarian part of the Pannonian Plain (HORVÁTH *et al.* 2013, 165, table 3; FRÎNCULEASA *et al.* 2017b, 123, 124, table 5). For this zone, ^{14}C dates were obtained for burials of different funerary traditions of the Pre-Yamnaya phase from the second half of the 4th millennium BC. In addition to grave 6 from barrow II at Tiszavasvári–Deákhalom (extended inhumation) discussed earlier, there were also burials with skeletons laid on their sides in a contracted position (Sárrétudvari–Órhalom, graves 8 and 12). However, the majority of burials represent the tradition of the Yamnaya culture, which is confirmed by their radiocarbon dating to the first half of the 3rd millennium BC. Of particular importance for comparisons with Vojvodina are the results obtained for the well-known barrow cluster at Kétegyháza–Kétegyházi tanyák (ECSEDY 1979, 21–33) in southeastern Hungary (Fig. 15). What makes them particularly important is the sequence of graves recorded in the monumental mound of Török-halom (barrow 3). Four burials were discovered there on different levels – all undeniably linked to the Yamnaya tradition. Referring to the typological findings presented above, all these burials reveal features of the older phase, and a good reference for them is “Humka u Barnahatu” from Padej. Analogies can be seen in the way the burials were laid out, the parameters of the pit, the way wooden elements were used in the bottom part of the grave, and the use of a white, calcaceous substance in the funerary rituals. In the 1970s, a ^{14}C date was obtained for grave 4 from the Török-halom (secondary burial, associated with the youngest, third phase of mound construction), confirming the older chronological position of this grave, although the large standard error means this result is not precise (ECSEDY 1979, 52). This estimate was not confirmed by a more recent result, obtained for wood from grave 7, occupying the primary stratigraphic position (GERLING 2015, 355). This result (2845–2573 BC) points with high probability to the younger phase of the Yamnaya culture. Given the

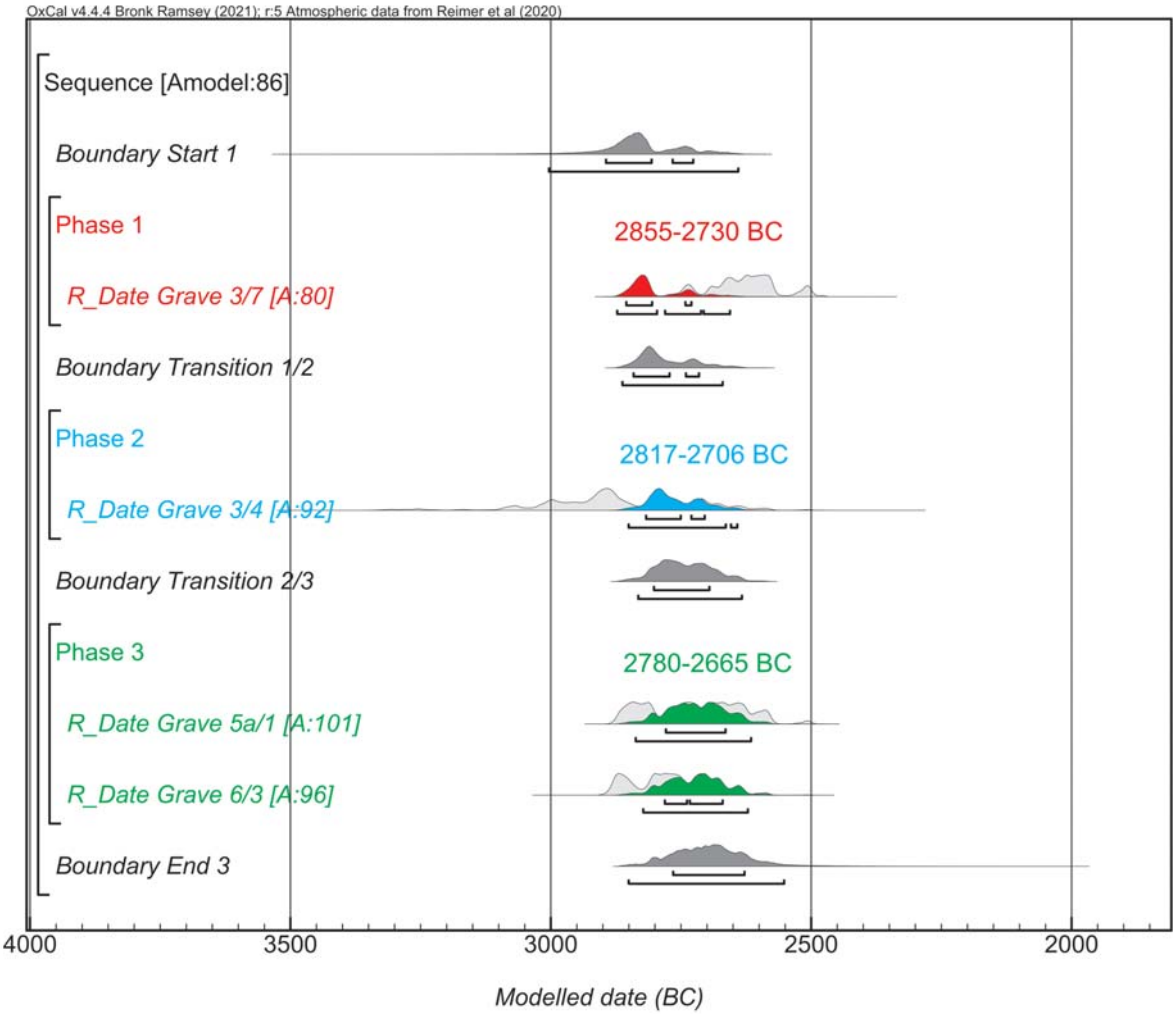


Fig. 15. Chronological modeling of Yamnaya burials from Kétegyháza–Kétegyházi tanyák (see Table 6)

instructive stratigraphic situation, the Kétegyháza barrow might become a benchmark for chronological studies. However, the limited and controversial results of absolute dating do not allow for this. Two other dates available for the cluster discussed here were obtained for barrows 5a and 6. They refer to the younger phase of Yamnaya culture (Table 6). In contrast, two dates from graves from Kunhegyes–Nagyállásalom (HORVÁTH *et al.* 2013, 165, tab. 3) can be credibly synchronized with the burials from Perlez–Vuna and Pančevo–Livade in Vojvodina representing a similar ritual (cf. DANI 2011, 45, fig. 3: 1, 2).

Table 6. Radiocarbon datings of Yamnaya graves from Kétegyháza–Kétegyházi tanyák in southern Hungary (after ECSÉDY 1979; HORVÁTH *et al.* 2013; GERLING 2015)

No.	Barrow No.	Grave No.	Dated material	Lab. No.	Age ¹⁴ C BP	Calendar age BC (68.2%)
1	3	4	Human bone	Bln-609	4265±80	3011–2699
2	3	7	Human bone	Poz-39103	4090±35	2845–2573
3	5a	1	Human bone	Poz-39105	4130±40	2862–2629
4	6	3	Human bone	Poz-39106	4180±40	2881–2679

The chronometric data obtained for graves from Romania (apart from Banat, discussed above) are important because the phase preceding the Yamnaya culture barrows is clearly legible there (e.g. FRÎNCULEASA *et al.* 2015; 2017a; 2017b; 2019a; PREDA-BĂLĂNICĂ *et al.* 2020). For the finds from southeastern Romania, a consistency between the typochronological findings and the results of absolute dating is evident. The appearance of the funerary ritual with features of the Yamnaya culture dates to the turn of the 4th and 3rd millennium BC. Barrow burials from before that time represent still fully undefined funerary traditions, showing on the one hand a connection with the rituals of the northwestern Pontic zone, and on the other hand a strong relation to local cultural groupings (above all: Coțofeni). Particularly relevant for the dating of Yamnaya culture graves are the ¹⁴C results obtained for the Movila Mare barrow at Smeeni (FRÎNCULEASA *et al.* 2017b, 109–114). First, the older and younger phases of the Yamnaya ritual were distinguished there. Second, the presence of burials of the Katakombnaya culture, marking *a terminus ante quem* for the Yamnaya culture graves, makes this site unique. The Katakombnaya graves from Smeeni are dated to about 2600–2500 BC. This limit could also be valid for the finds from Vojvodina, where a ¹⁴C date indicating an age similar or only slightly older than the Katakombnaya burials mentioned above was only obtained for the grave from Pančevo-Livade.

Based on absolute age determinations currently available from Bulgaria (e.g. KAISER – WINGER 2015; ALEXANDROV – KAISER 2016; FRÎNCULEASA *et al.* 2017b, 124–128) it is still difficult to construct a chronological scheme that would take into account the richness and cultural diversity of barrow burials from this area. This situation is likely to be altered by a series of new high-precision results, so far only signalled in the literature (ALEXANDROV 2021). In general, the area also shows a succession of Yamnaya culture burials after graves of the Pre-Yamnaya phase, around 3100–3000 BC. The vast majority of burials displaying ritual features of the Yamnaya culture come from the first half of the 3rd millennium BC.

The above-mentioned dates from the Danube-Tisza zone of the expansion of steppe communities indicate that the finds from the area of Vojvodina (as well as from the entire Pannonian Plain) fit well into the general pattern of changes in funerary ritual observed throughout the western range of the Yamnaya culture. In light of the absolute chronological data, no retardations can be noticed that could indicate the later age of the finds from the Pannonian Plain in comparison with the materials from the Pontic zone. In each region, graves of the older Yamnaya phase can be distinguished from those representing the younger phase, both on the basis of ¹⁴C dating and through analyses of funerary ritual features.

A special problem in the chronometric study of the Yamnaya barrows in the Pannonian Plain is their relationship with the settlement materials of the Baden, Kostolac, and Vučedol cultures. Our knowledge in this respect is still far from complete, especially when it comes to clarifying chronological sequences in individual regions. The lack of hard chronometric data leads to different, often contradicting views being proposed. Some approaches point to the synchronous settlement of the Baden and Yamnaya communities in the Pannonian Basin (e.g. KALICZ 1999), while others emphasize a hiatus between them (e.g. DIACONESCU 2020; KOLEDIN *et al.* 2020). Situations where barrows are located on settlements of the Kostolac and Baden cultures, as at Jabuka, Padej or Perlez in the Vojvodina area, are sometimes interpreted as non-coincidental (e.g. ECSÉDY 1979, 51; HEYD 2011, 542; DANI 2020, 49, 50). However, a direct contact between the communities of the two cultural groupings has not yet been convincingly demonstrated anywhere in the area. In the case of the barrow at Mokrin, it can be assumed that the situation is similar to the Romanian sites of Dudeștii Vechi and Silvașu de Jos (KRAUSS *et al.* 2016; DIACONESCU 2020): the cremation burial of the Baden culture was created in the last centuries of the 4th millennium BC, and the inhumation burial already in the 3rd millennium BC. The paucity of information on the barrows at Srpski Krstur and Skorenovac does not allow the creation of chronological sequences. On the other hand, at Padej (“Humka u Barnahatu”) and Perlez (“Pašićeva humka”) settlement materials

associated with the classical phase of the Baden culture have been discovered within and under the mounds. In light of general chronological schemes (e.g. FURHOLT 2009), such materials should be referred to the last quarter of the 4th millennium BC, and certainly no later than around 2900 BC (e.g. STADLER *et al.* 2001; HORVÁTH – SVINGOR 2015). They are therefore clearly older than the burials from Perlez, and most probably also than graves 1 and 2 from Padej. On the other hand, at Jabuka-Tri humke, in addition to the materials of the Baden culture analogous to those at Padej and Perlez, traces of the Kostolac culture occupation were also discovered under the barrow. Lj. Bukvić emphasized the hiatus separating the Kostolac settlement episode and the erection of the Yamnaya culture barrow (BUKVIĆ 1987, 84, 85). The age of the central burial was determined to be between 2848 and 2577 BC (*Table 2*). Estimating the age of the Kostolac culture settlement on the basis of radiocarbon dating as the turn of the 4th and 3rd millennium BC, we would gain confirmation of a clear time gap between the settlement materials of the Baden and Kostolac cultures and the Yamnaya culture barrow. However, some Kostolac culture finds have younger dates, indicating a range of 2800–2600 BC. This suggests their contemporaneity with the Yamnaya barrows in Vojvodina (cf. KRAUSS – CIOBOTARU 2013; DIACONESCU 2020). This is currently a difficult problem to solve, especially that for the Kostolac culture in Vojvodina we have only single radiocarbon dates from the Gomolava tell in Srem. A cultural succession of Baden → Kostolac → Vučedol is evident in this area, which puts into question the survival of the Kostolac settlement beyond the beginning of the 3rd millennium BC. This is a problem that future chronometric studies could readily address.

9. Recapitulation

In light of the above analyses, we can distinguish three phases of the formation of barrow cemeteries in Vojvodina in the second half of the 4th and the first half of the 3rd millennium BC. The first of these is still poorly established chronometrically and is associated with barrows with cremation burials, showing a relationship with the Baden cultural circle (approximately: 3300–3100 BC). The second phase is connected with the early expansion of the Yamnaya culture (3000–2900 BC) and is represented by burials from Padej (graves 1 and 2) and Šajkaš (site 2). The third phase corresponds to the younger/ classic Yamnaya culture and is represented by most of the barrow burials discovered to date in Vojvodina (ca. 2900–2600/2500 BC). Barrows from Srem, with burials connected to the Vučedol circle, probably also belong to this period. The barrow ritual in this period clearly expands into the neighbouring areas, beyond the zone of the Danube-Tisza lowlands. This is exemplified by chronometrically confirmed barrows from the Šumadija region in Serbia (BULATOVIĆ *et al.* 2020) or from northeastern Bosnia (GAVRANOVIĆ *et al.* 2020).

In terms of funerary rituals, the vast majority of barrow burials from Vojvodina show supra-regional features characteristic of steppe communities with their origins in eastern Europe. This may indicate that the expansion of these communities was directed to the lowland areas of the Pannonian Basin, which were particularly convenient for their economic model. In the first half of the 3rd millennium BC, Yamnaya culture groups became the dominant element in this zone, eliminating or marginalizing the development of local sedentary or semi-sedentary communities.

It is worth noting that the limited pool of material limits our ability to trace genetic relationships between steppe communities and local groupings of the late Eneolithic and Early Bronze Age. At the present stage of research, it is only worth noting the contemporaneity of the barrows of the Vučedol (Batajnica and Vojka) and Yamnaya cultures. However, barrows of steppe communities coinciding in age with the barrows linked to the Baden and Coțofeni complexes are absent. New discoveries in the

future can be expected to paint a significantly more diversified picture of barrow funerary rituals in the territory of Vojvodina.

References

AGULNIKOV, S. – POPOVICH, S. 2010

Obriad demembratsii v yamnoy kulture pruto-dniestrovskogo mezhdurech'ia. In: *Problemy okhrany i izucheniya pamiatnikov arkheologii stepnoy zony vostochnoy Evropy*. Lugansk 2010, 324–349.

ALEXANDROV, S. 2009

Ukrasheniya za kosa ot zlato i srebro prez bronzovata epokha v severna B'lgariya. *Arkheologiya* (Sofia) 50/1–2 (2009) 7–20.

ALEXANDROV, S. 2010

Prehistoric barrow graves with extended inhumations between the Danube and the Balkan Range. *Studia Praehistorica* 13 (2010) 277–292.

ALEXANDROV, S. 2019

Early Bronze Age barrows in north-west Bulgaria. In: Filipović, V. – Bulatović, A. – Kapuran, A. (eds): *Zbornik radova u chast 80 g. zhivota Rastka Vasicha*. Beograd 2019, 75–94.

ALEXANDROV, S. 2020

Bronze Age barrow graves in Upper Thrace – Old and New Questions. In: Hansen, S. (ed.): *Repräsentationen der Macht. Beiträge des Festkolloquiums zu Ehren des 65. Geburtstag von Blagoje Govedarica*. Deutsches Archäologisches Institut. Eurasien Abteilung Berlin. Kolloquien zur Vor- und Frühgeschichte 25. Berlin 2020, 147–170.

ALEXANDROV, S. 2021

Fourth/third millennium BC barrow graves in North-East Bulgaria (120 years of investigations). In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds): *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe 2. Budapest 2021, 271–314.

ALEXANDROV, S. – KAISER, E. 2016

The Early Barrow Graves in West Pontic Area. Cultures? Migrations? Interactions? In: Nikolov, V. – Schier, W. (eds): *Der Schwarzmeerraum vom Neolithikum bis in die Frühbronzezeit (6000–600 v. Chr.). Kulturelle Interferenzen in der zirkumpontischen Zone und Kontakte mit ihren Nachbargebieten*. Prähistorische Archäologie in Südosteuropa 30. Rahden/Westf. 2016, 359–370.

ANTHONY, D. W. 2007

The Horse, the Wheel and the Language. How Bronze-Age riders from the Eurasian steppes shaped the modern world. Princeton, Oxford 2007.

BATISTIĆ-POPADIĆ, D. 1986

Pregled nalazišta. In: Batistić-Popadić D. – Uzelac J.: *Eneolit južnog Banata. Katalog uz izložbu*. Pančevo – Vršac 1986, 13–44.

BOZKOVA, A. – TONKOVA, E. 2020

Obekt A1/7002 kray Vetrino, oblast Varna/Site A1/7002 near Vetrino, Varna region. In: Popov, H. et al. (eds): *Potok prez Vremeto. Spasitelni arheologicheski prouchvaniya po razshirenieto na gazoprenosnata mrezha na „Bulgartransgaz“ EAD*. Sofia 2020, 450–453.

- BUGAJ, U. – JAROSZ, P. – KOLEDIN, J. – PODSIADŁO, M. – WŁODARCZAK, P. 2021
Excavation of “Ciganska humka” in Šajkaš. In: Jarosz, P. – Koledin, J. – Włodarczak, P. (eds): *Danubian Route of the Yamnaya Culture. The Barrows of Vojvodina. The Yamnaya Impact on Prehistoric Europe 3*. Budapest 2021, 47–70.
- BUKVIĆ, LJ. 1978
Results of the researches of the mound near Jabuka – a contribution to the study of the culture of graves under tumuli. *Archaeologia Iugoslavica* (1978) 14–18.
- BUKVIĆ, LJ. 1982
Tri humke, Jabuka – naselje kostolačke kulture i eneolitska humka. *Arheološki pregled* 23 (1982) 34–36.
- BUKVIĆ, LJ. 1987
Die ältesten Hügelbestattungen im südlichen Banat. In: Srejskić, D. – Tasić, N. (eds): *Hügelbestattungen in der Karpaten-Donau-Balkan-Zone während der äneolithischen Periode. Internationales Symposium Donji Milanovac 1985*. Balkanoški Institut Sanu. Posebna Izdanja 29. Beograd 1987, 83–85.
- BULATOVIĆ, A. 2014
Cord Ware in the Central and Southern Balkans: a consequence of cultural interaction or an indication of ethnic change? *The Journal of Indo-European Studies* 42/1–2 (2014) 101–143.
- BULATOVIĆ, A. – GORI, M. – VANDER LINDEN, M. 2020
Radiocarbon dating the 3rd millennium BC in the central Balkans: a re-examination of the Early Bronze Age sequence. *Radiocarbon* 62/5 (2020) 1163–1191.
- CHIOJDEANU, C. – STAN, D. S. – CONSTANTINESCU, B. 2011
Gold and silver coating characterization using an X-ray fluorescend based method – the case of archaeological artifacts. *Romanian Reports in Physics* 63/3 (2011) 685–692.
- CIUGUDEAN, H. 1995
The later Eneolithic/Early Bronze Age Tumulus-Burials in Central and South-Western Transylvania (I). *Apulum* 32 (1995) 13–33.
- CIUGUDEAN, H. 1996
Epoca timpurie a bronzului în centrul și sud-vestul Transilvaniei. Biblioteca Thracologica 13. București.
- CIUGUDEAN, H. 2011
Mounds and mountains: burial rituals in Early Bronze Age Transylvania. In: Berecki, S. – Németh, R. E. – Rezi, B. (eds): *Bronze Age Rites and Rituals in the Carpathian Basin Proceedings of the International Colloquium from Târgu Mureș*. Bibliotheca Mvsei Marisiensis, Seria Archaeologica 4. Târgu Mureș 2011, 21–57.
- COMȘA, E. 1982
Morminte cu ocră descoperite la Corlăteni. *Thraco-Dacica* 3 (1982) 85–93.
- DANI, J. 2011
Research of Pit-Grave culture kurgans in Hungary in the last three decades. In: Pető, Á. – Barcsi, A. (eds): *Kurgan Studies. An environmental and archaeological multiproxy study of burial mounds in the Eurasian steppe zone*. BAR International Series 2238. Oxford 2011, 25–69.
- DANI, J. 2020
Kurgans and their builders. *Hungarian Archaeology* 9 (2020) 46–66.

DANI, J. 2021

Milleker's pride. In: Jarosz, P. – Koledin, J. – Włodarczak, P. (eds): *Danubian Route of the Yamnaya Culture. The Barrows of Vojvodina. The Yamnaya Impact on Prehistoric Europe 3*. Budapest 2021, 195–206.

DANI, J. – MÁRKUS, G. – KULCSÁR, G. – HEYD, V. – WŁODARCZAK, P. – ZITNAN, A. – PEŠKA, J. 2017

A „Yamnaya impact project” régészeti topográfiai tanulságai. In: Benkő, E. – Bondár, M. – Kolláth, Á. (eds): *Magyarország régészeti topográfiája. Múlt, jelen, jövő*. Budapest 2017, 137–150.

DANI, J. – NEPPER, I. M. 2006

Sárrétudvari-Örhalom. Tumulus grave from the beginning of the EBA in Eastern Hungary. *Communicationes Archaeologicae Hungariae* 2006 (2006) 29–48.

DERGACHEV, V. A. 1986

Moldaviya i sosedniye territorii v epokhu bronzy. Kishinev 1986.

DERGACHEV, V. A. – MANZURA, I. V. 1991

Pogrebalnye komplekxy pozdnego Tripolia. Kishinev 1991.

DIACONESCU, D. 2020

Steppe by steppe: Yamnaya culture in Transylvania. *Praehistorische Zeitschrift* 95/1 (2020) 17–47.

DIACONESCU, D. – TINCU, S. 2016

Considerații arheologice privind necropola tumulară de la Silvașu de Jos-Dealul Țapului (oraș Hațeg, jud. Hunedoara). *Analele Banatului* 24 (2016) 107–141.

DIMITRIJEVIĆ, S. 1979

Badenska kultura. In: Tasić, N. (ed.): *Praistorija jugoslavenkih zemalja III*. Sarajevo 1979, 183–234.

ĐORĐEVIĆ, J. – ĐORĐEVIĆ, V. 2016

Livade kod Pančeva. Srednjovekovna crkva i nekropola na eneolitskoj humci. Pančevo 2016.

ECSEDY, I. 1979

The People of the Pit-Grave Kurgans in Eastern Hungary. *Fontes Archaeologici Hungariae*. Budapest 1979.

FRÎNCULEASA, A. – PREDA, B. – HEYD, V. 2015

Pit-Graves, Yamnaya and kurgans along the lower Danube: disentangling IVth and IIIrd millennium BC burial customs, equipment and chronology. *Praehistorische Zeitschrift* 90/1–2 (2015) 45–113.

FRÎNCULEASA, A. – MIREA, P. – TROHANI, G. 2017a

Local cultural settings and transregional phenomena: a funerary ritual in the lower Danube in the 4th millenium BC. *Buletinul Muzeului Județean Teleorman. Seria Arheologie* 9 (2017) 75–116.

FRÎNCULEASA, A. – SIMALCSIK, A. – PREDA, B. – GARVĂN, D. 2017b

Smeeni – Movila Mare. Monografia unui sit arheologic regăsit. Biblioteca Mousaios 13. Buzău 2017.

FRÎNCULEASA, A. – PREDA-BĂLĂNICĂ, B. – GARVĂN, D. – NEGREA, O. – SOFICARU, A. 2019a

Towards a better understanding of the end of the Fourth Millennium BC in Northern Muntenia: The case of the Burial mound in Ploiești – Gara de vest. *Ziridava. Studia Archaeologica* 33 (2019) 55–90.

- FRÎNCULEASA, A. – PREDĂ-BĂLĂNICĂ, B. – SIMALCSIK, A. – NEGREA, O. – CONSTANTINESCU, B. – STAN, D. 2019b
Morminte Iamnaia într-un tumul redescoperit și salvat în localitatea Blejoi (jud. Prahova). *Buletinul Muzeului Județean Teleorman* 11 (2019) 35–78.
- FURHOLT, M. 2009
Die nördlichen Badener Keramikstile im Kontext des mitteleuropäischen Spätneolithikums (3650–2900 v. Chr.). Studien zur Archäologie in Ostmitteleuropa 3. Bonn 2009.
- GARAȘANIN, D. 1987
Die Herkunft der westserbischen Hügelgräber. In: Srežović, D. – Tasić, N. (eds): *Hügelbestattungen in der Karpaten-Donau-Balkan-Zone während der äneolithischen Periode. Internationales Symposium Donji Milanovac 1985*. Balkanoški Institut Sanu. Posebna Izdanja 29. Beograd 1987, 51–55.
- GARAȘANIN, M. V. 1959
Neolithikum und Bronzezeit in Serbien und Makedonien. Überblick über den Stand der Forschung 1958. *Bericht der Römisch-Germanischen Kommission* 39 (1959) 1–130.
- GAVRANOVIĆ, M. – ANTIĆ, S. – MEYER, C. – PETSCHKO, I. – BULATOVIĆ, J. – WALTENBERGER, L. 2021
A multi-phased burial mound in Novo Selo near Bijeljina. Višeslojni tumul u Novom Selu kod Bijeljine. *Prilozi Instituta za arheologiju u Zagrebu* 38/1 (2021) 33–74.
- GERLING, C. 2015
Prehistoric Mobility and Diet in the West Eurasian Steppes, 3500 to 300 BC: An isotopic approach. Berlin 2015.
- GIRIĆ, M. 1974
Mokrin – Arađanska humka. In: Brukner, B. (ed.): *Vojvodina u bakarnom i ranom bronzanom dobu*. Katalog. Novi Sad 1974, 21.
- GIRIĆ, M. 1982
Über die Erforschung der Grabhügel in der Wojwodina. In: Aspes, A. (ed.): *Il passaggio dal neolitico all'età del bronzo nell'Europa centrale e nella regione alpine. Problemi cronologici e terminologici. Atti del X Simposio Internazionale sulla fine del Neolitico e gli inizi dell'età del Bronzo in Europa*. Verona 1982, 99–105.
- GIRIĆ, M. 1987
Die Erforschung der Hügelgräber im nördlichen Banat. In: Srežović, D. – Tasić, N. (eds): *Hügelbestattungen in der Karpaten-Donau-Balkan-Zone während der äneolithischen Periode. Internationales Symposium Donji Milanovac 1985*. Balkanoški Institut Sanu. Posebna Izdanja 29. Beograd 1987, 71–76.
- GIRIĆ, M. 1994
Humke donjeg toka Moriša – severozapadni Banat (Jugoslavija – Mađarska – Rumunija). *Rad Muzeja Vojvodine* 36 (1994) 7–12.
- HÄUSLER, A. 1974
Die Gräber der älteren Ockergrabkultur zwischen Ural und Dnepr. Berlin 1974.
- HÄUSLER, A. 1976
Die Gräber der älteren Ockergrabkultur zwischen Dnepr und Karpaten. Berlin 1976.

HEGEDŰS, K. 1978

Der Tumulus mit dem Grubengrab von Szentes-Besenyőhalom. *Móra Ferenc Múzeum Évkönyve* 1976–77/1 (1978) 27–37.

HEYD, V. 2011

Yamnaya groups and tumuli west of the Black Sea. In: Borgna, E. – Müller Celka, S. (eds): *Ancestral Landscapes. Burial mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th–2nd millennium B. C.)* Travaux Maison Orient 58. Lyon 2011, 535–556.

HEYD, V. 2021

Yamnaya, Corded Wares and Bell Beakers on the move. In: Heyd, V. – Kulcsár, G. – Preda-Bălănică (eds): *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25–26 April 2019. The Yamnaya Impact on Prehistoric Europe 2*. Budapest 2021, 383–414.

HORVÁTH, T. – DANI, J. – PETŐ, Á. – POSPIESZNY, Ł. – SVINGOR, É. 2013

Multidisciplinary contributions to the study of Pit Grave Culture kurgans of the Great Hungarian Plain. In: Heyd, V. – Kulcsár, G. – Szeverényi, V. (eds): *Transitions to the Bronze Age. Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighbouring Regions*. Budapest 2013, 153–179.

HORVÁTH, T. – SVINGOR, É. 2015

The spatial and chronological distribution of the so called “Baden culture”. In: Nowak, M. – Zastawny, A. (eds): *The Baden Culture around the Western Carpathians*. Via Archaeologica. Źródła z badań wykopaliskowych na trasie autostrady A4 w Małopolsce. Kraków 2015, 19–74.

ILIEV, I. K. – BAKĀRDŹIEV, S. 2020

Kurgane der Frühen bis Späten Bronzezeit im Bezirk Jambol, Südostbulgarien. The Yamnaya Impact on Prehistoric Europe 1. Budapest 2020.

IVANOVA, S. V. 2007

„Serebrianyi vek” Severo-Zapadnogo Prichernomoria. Vid neolitu do Kimeriytsiv. *Materyaly ta doslidzheniya z arkeologii Schidnoy Ukrainy* 72. Lugansk 2007, 85–91.

IVANOVA, S. W. 2015

„Protobudzhakskiy gorizont” Severo-Zapadnogo Prichernomorya. *Stratum plus* 2 (2015) 275–294.

JANKULOV, B. 1936

Preistorijsko doba Vojvodine. *Glasnik Istorijeskog društva u Novom Sadu* 9 (1936) 241–256.

JANKULOV, B. 1939

Novije preistoriske iskopine kod Jaše Tomića. *Glasnik Istorijeskog društva u Novom Sadu* 12 (1939) 254–256.

JAROSZ, P. – KOLEDIN, J. – PODSIADŁO, M. – WŁODARCZAK, P. 2021

Excavation of “Medisova humka” at Źabalj. In: Jarosz, P. – Koledin, J. – Włodarczak, P. (eds): *Danubian Route of the Yamnaya Culture. The Barrows of Vojvodina*. The Yamnaya Impact on Prehistoric Europe 3. Budapest 2021, 103–136.

JOVANOVIĆ, B. 1969

Vojlovica, Pančevo – humka ranog bronzanog doba. *Arheološki pregled* 11 (1969) 47–49, Table 18.

JOVANOVIĆ, B. 1974a

Indoevropljani i stepska kultura grobova jama u ranom bronzanom dobu Podunavlja. In: Brukner, B. (ed.): *Istraživanja* 3. Novi Sad 1974, 5–24.

JOVANOVIĆ, B. 1974b

Pozni eneolit. In: Brukner, B. – Jovanović, B. – Tasić, N.: *Praistorija Vojvodine*. Novi Sad 1974, 153–183.

JOVANOVIĆ, B. 1976a

Tumuli stepske kulture grobova jama u Podunavlju. *Starinar* 26 (1976) 9–24.

JOVANOVIĆ, B. 1976b

The Kurgan (pit-grave) steppe culture in south Vojvodina. In: Brukner, B. (ed.): *Istraživanja* 5. Novi Sad 1976, 59–64.

JOVANOVIĆ, B. 1979

Stepska kultura u eneolitskom periodu Jugoslavije. In: Tasić, N. (ed.): *Praistorija jugoslavenskih zemalja* III. Sarajevo 1979, 381–395.

JOVANOVIĆ, B. 1992

Chronological relations of late Aeneolithic of the central and eastern Balkans. *Balkanica* 23 (1992) 243–253.

KAISER, E. – WINGER, K. 2015

Pit graves in Bulgaria and the Yamnaya Culture. *Praehistorische Zeitschrift* 90/1–2 (2015) 114–140.

KALICZ, N. 1999

A késő rézkori badeni kultúra temetője Mezőcsát–Hörcsögösön és Tiszavasvári– Gyepároson. *A Herman Ottó Múzeum Évkönyve* 37 (1999) 57–101.

KALUŻNA-CZAPLIŃSKA, J. – ROSIAK, A. – SIKORSKI, A. – ŻURKIEWICZ, D. 2017

Barrow culture textiles and mats in the middle Dniester area. *Baltic-Pontic Studies* 22 (2017) 166–190.

KITOV, G. – PANAYOTOV, I. – PAVLOV, P. 1991

Mogilni nekropoli v Loveshkiya kray. Ranna bronzova epokha (nekropol Goran-Slatina). Razkopki i prouchvaniya 23. Sofia 1991.

KOLEDIN, J. 2008

Prilog poznavanju rasprostranjenosti zvonastih pehara. *Rad Muzeja Vojvodine* 50 (2008) 33–59.

KOLEDIN, J. – BUGAJ, U. – JAROSZ, P. – NOVAK, M. – PRZYBYŁA, M. M. – PODSIADŁO, M. – SZCZEPANEK, A. – SPAŚIĆ, M. – WŁODARCZAK, P. 2020

First archaeological investigations of barrows in the Bačka region and the question of the Eneolithic/ Early Bronze Age barrows in Vojvodina. *Praehistorische Zeitschrift* 95/2 (2020) 350–375.

KOŚKO, A. 2001

Z badań nad genezą rytuałów kremacji w bałkańsko-środkowoeuropejskim kręgu kulturowym. In: Ginter, B. – Drobniewicz, B. – Kazior, K. – Nowak, M. – Połtowicz, M. (eds): *Problemy epoki kamienia na obszarze Starego Świata. Księga Jubileuszowa dedykowana Profesorowi Januszowi K. Kozłowskiemu*. Kraków 2001, 405–412.

KOŚKO, A. – VIDEIKO, M. Y. 1995

Origins of Neolithic – Eneolithic cremation rites in Europe and Sofievka type rituals. *Baltic-Pontic Studies* 3 (1995) 247–258.

KOVALEVA, I. 1978

Pamatniki zhivotilovskogo tipa v Prisamare. In: Kovaleva, I. F. – Bolebrukh, A. G. – Kostenko, V. I. (eds): *Kurgannye drevnosti Stepnogo Podneprovya v III-I tys. do n.e.* Dnepropetrovsk 1978, 46–54.

KRAUSS, R. – SZMID, C. – CIOBOTARU, D. – SLAVCHEV, V. 2016

Varna und die Folgen – Überlegungen zu den Ockergräbern zwischen Karpatenbecken und der nördlichen Ägäis. In: Bartelheim, M. – Horejs, B. – Krauß, R. (eds): *Von Baden bis Troia. Ressourcennutzung, Metallurgie und Wissenstransfer. Eine Jubiläumsschrift für Ernst Pernicka*. Rahden/Westf. 2016, 273–315.

KRAUSS, R. – CIOBOTARU, D. 2013

Daten zum Ende des Badener Keramikstils und dem Beginn der Frühbronzezeit aus Foeni-Gaz im rumänischen Banat. Mit Beiträgen zur absoluten Datierung und zu den bronzezeitlichen Tierknochen von Bernhard Weninger und Georgeta El Susi. *Praehistorische Zeitschrift* 88/1–2 (2013) 38–113.

KRISTIANSEN, K. – ALLENTOF, M. E. – FREI, K. M. – IVERSEN, R. – JOHANSEN, N. N. – KROONEN, G. et al. 2017

Re-theorising mobility and the formation of culture and language among the Corded Ware Culture in Europe. *Antiquity* 91 (2017) 334–347.

LARINA, O. 1989

Novye kurganne materialy eneolita – ranney bronzy na srednem Prute. In: Ketraru N. A. (ed.): *Arkheologicheskoye issledovaniya v Moldavii v 1984 g.* Kishinev 1989, 61–76.

LAZIĆ, M. 1989

Topografija i tipologija praistorijskih tumula u Srbiji i Crnoj gori. Beograd 1989.

LUCA, S. A. – DIACONESCU, D. – ROMAN, C. C. – TINC, S. 2012

The Archeological Research from Silvașu de Jos–Dealul Țapului. The Archaeological Campaigns from 2006–2010. In: Cosma, C. (ed.): *Studii de Arheologie și Istorie. Omagiu Profesorului Nicolae Gudea la 70 de ani*. Seria Interferențe Etnice și Culturale in milenii I a. Chr. – I p. Chr. 20. Cluj-Napoca 2012, 43–76.

MANZURA, I. V. 2010

„Vytianutyje” pogrebeniya epokhi eneolita v Karpato-Dnestrovskom Regione. *Tyragetia. Serie nouă* 4/1, 35–47.

MANZURA, I. V. 2016

North Pontic steppes at the end of the 4th millenium BC: the epoch of broken borders. In: Zanoci, A. – Kaiser, E. – Kashuba, M. – Izbitser, E. – Băț, M. (eds): *Man, Culture and Society from the Copper Age until the Early Iron Age in Northern Eurasia. Contributions in honour of the 60th anniversary of Eugen Sava*. Tyragetia International 1. Chisinau 2016, 149–171.

MEDOVIĆ, P. 1987

Resultate der Untersuchungen auf drei Grabhügeln in der Gemarkung des Dorfes Perlez im mittleren Banat. In: Srejić, D. – Tasić, N. (eds): *Hügelbestattungen in der Karpaten-Donau-Balkan-Zone während der äneolithischen Periode. Internationales Symposium Donji Milanovac 1985*. Balkanoški Institut Sanu. Posebna Izdanja 29. Beograd 1987, 77–82.

MILLEKER, F. 1901

Régészeti ásatások Ulmán. *Történelmi és régészeti értesítő* 17/3–4 (1901) 19–22.

MILLEKER, F. 1906

Délmagyarország régiségleletei a honfoglalás előtti időkből III. Temesvár 1906.

NADLAČKI, L. 1950

Slatinska humka između Đale i Srpskog Krstura u severnom Banatu. *Naučni zbornik Matice srpske* 1 (1950) 272–274.

NEPPER, I. M. 1977

Okkersíros temetkezés Püspökladány–Kincsesdombon. *A Debreceni Déri Múzeum Évkönyve 1976* (1977) 49–65.

NIKOLOV, B. 1976

Mogilni pogrebeniya ot rannobronzovata epokha pri Trnava I Knezha, Vrachanski okrg. *Arkheologiya* 18/3 (1976) 38–51.

NOVAK, M. 2021

Bioarchaeology of the Yamnaya skeletons from Vojvodina. In: Jarosz, P. – Koledin, J. – Włodarczak, P. (eds): *Danubian Route of the Yamnaya culture. The Barrows of Vojvodina. The Yamnaya Impact on Prehistoric Europe 3*. Budapest 2021, 137–148.

OSTROVERKHOV, A. S. – SUBBOTIN, L. V. – SUBBOTIN, A. V. 1993

Kurhan epokhi bronzы-eneolita u s. Tymkovo. In: *Arkheologichni doslidzhennia v Ukrayini 1991 g.* Lutsk 1993, 83–84.

PANAYOTOV, I. 1989

Yamnata kultura v Blgarskite zemi. Razkopki i Prouchvaniya 21. Sofia 1989.

PREDA-BĂLĂNICĂ, B. – FRÎNCULEASA, A. – HEYD, V. 2020

The Yamnaya impact north of the Lower Danube: A tale of newcomers and locals. *Bulletin de la Société préhistorique française* 117/1 (2020) 85–101.

RASSAMAKIN, YU. YA. 1993

Eneolit stepnogo Prichernomoria i Priazovia. In: Georgieva, P. (ed.): *The Fourth Millenium B.C.* Sofia 1993, 5–28.

RASSAMAKIN, YU. YA. 1999

The Eneolithic of the Black Sea Steppe: Dynamics of cultural and economic development 4500–2300 BC. In: Levine, M. – Rassamakin, Yu. – Kislenko, A. – Tatarintseva, N. (eds): *Late Prehistoric Exploitation of the Eurasian Steppes*. Cambridge 1999, 59–182.

RASSAMAKIN, YU. YA. 2004

Die nordpontische Steppe in der Kupferzeit Gräber aus der Mitte des 5. Jts. bis Ende des 4. Jts. v. Chr. Archäologie in Eurasien 17. Mainz 2004.

RASSAMAKIN, YU. YA. 2013a

Pokhovannia kvityanskoj kultury v konteksti absolutnoj khronologii. *Arkheologiya* 4 (2013) 17–41.

RASSAMAKIN, YU. YA. 2013b

From the Late Eneolithic Period to the Early Bronze Age in the Black Sea Steppe: What is the Pit Grave Culture (Late Fourth to Mid-Third Millenium BC)? In: Heyd, V. – Kulcsár, G. – Szeverényi, V. (eds): *Transitions to the Bronze Age. Interregional Interaction and socio-Cultural Change in the Third Millenium BC Carpathian Basin and Neighbouring Regions*. Budapest 2013, 113–138.

ROMAN, P. 1976

Kontakte der Coțofeni-Kultur mit den Baden-Kostolac und Vučedol-Kulturen im westen Rumäniens. In: Brukner, B. (ed.): *Istraživanja* 5. Novi Sad 1976, 143–148.

RÖGL, F. 1999

Mediterranean and Paratethys. Facts and hypotheses of an oligocene to miocene paleogeography (short overview). *Geologica Carpathica* 50/4 (1999) 339–349.

SACHSSE, C. 2010

Untersuchungen zu den Bestattungssitten der Badener Kultur. Universitätsforschungen zur Prähistorischen Archäologie 179. Bonn 2010.

SAVA, E. 2015

Bodrogkeresztúr and Baden discoveries from Sânpetru German, Arad County. *Ziridava. Studia Archaeologica* 29 (2015) 73–96.

SAVA, E. – AGULNIKOV, S. – MANZURA, I. 2019

Issledovaniya kurganov v budzhakskoy stepi (1980–1985). Chişinău 2019.

SCORRANO, G. – YEDIAI, F. E. – PINOTTI, T. – FEIZABADIFARAHANI, M. – KRISTIANSEN, K. 2021

The genetic and cultural impact of the Steppe migration into Europe. *Annals of Human Biology* 48/3 (2021) 223–233.

SPASIĆ, M. 2016

Vučedolski tumul na lokalitetu Batajnica – Velika humka. In: Špehar, P. – Strugar-Bevc, N.: *Batajnica – Velika humka. Ranomađarska nekropola*. Beograd 2016, 162–173.

STADLER, P. – DRAXLER, S. – FRIESINGER, H. – KUTSCHERA, W. – PRILLER, A. – ROM, W. et al. 2001

Absolute chronology for early civilizations in Austria and Central Europe using ^{14}C dating with accelerator mass spectrometry with special results for the absolute chronology of the Baden culture. In: Roman, P. – Diamandi, S. (eds): *Studia Danubiana, Series symposia II. Symposium Cernavoda III – Boleráz. Ein vorgeschichtliches Phänomen zwischen dem Oberrhein und der unteren Donau*. Bucureşti 2001, 541–562.

SUBBOTIN, A. V. – SUBBOTIN, L. V. – OSTROVERKHOV, A. S. 2000

Timkovskiy kurgan v svete problem stepnogo eneolita i kultur bronzovogo veka. In: Yarovoy, Y. V. (ed.): *Chobrukskiy arkheologicheskiy kompleksi drevniye kultury Podnestrovia*. Tiraspol 2000, 80–95.

TASIĆ, N. 1959

Velika humka kod Batajnice. *Arheološki pregled* 1 (1959) 30–31.

TASIĆ, N. 1967

Badenski i vučedolski kulturni kompleks u Jugoslaviji. Beograd 1967.

TASIĆ, N. 1977

Promene u načinu sahranjivanja u eneolitu Jugoslovenskog Podunavlja i severnog Balkana. *Balkanica* 8 (1977) 25–35.

TASIĆ, N. 1983

Jugoslovensko Podunavlje od indoevropske seobe do prodora Skita. Novi Sad – Beograd 1983.

TASIĆ, N. 1995

Eneolithic Cultures of Central and West Balkans. Belgrade 1995.

TASIĆ, N. 2004

Historical picture of development of Bronze Age cultures in Vojvodina. *Starinar* 53–54 (2004) 23–34.

TASIĆ, N. 2007

Praistorijske humke u Banatu. *Anali Ogranka SANU u Novom Sadu* 2 (2007) 67–77.

UZELAC, J. 2002

Eneolit južnog Banata. Vršac 2002.

VANGORODSKA, O. G. 1987

Virobi s zlota ta sibra v kulturakh eneolitu – bronzi iz teritorii Ukraini. *Arkheologiya* 59 (1987) 1–12.

WŁODARCZAK, P. 2000

Cord Ware culture barrows in western Little Poland. In: Kadrow, S. (ed.): *A Turning of Ages/ Im Wandel der Zeiten. Jubilee Book Dedicated to Professor Jan Machnik on His 70th Anniversary*. Kraków 2000, 481–506.

WŁODARCZAK, P. 2010

Dunajski szlak kultury grobów jamowych a problem genezy kultury ceramiki sznurowej. In: Czopek, S. – Kadrow, S. (eds): *Mente et rutro. Studia archaeologica Johanni Machnik viro doctissimo octogesimo vitae anno ab amicis, collegis et discipulis oblata*. Rzeszów 2010, 299–325.

WŁODARCZAK, P. 2014

The traits of Early-Bronze Pontic cultures in the development of old upland Corded Ware (Małopolska groups) and Złota culture communities. *Baltic-Pontic Studies* 19 (2014) 7–52.

WŁODARCZAK, P. 2017

Kurgan rites in the Eneolithic and Early Bronze Age Podolia in light of materials from the funerary-ceremonial centre at Yampil. *Baltic-Pontic Studies* 22 (2017) 246–283.

WŁODARCZAK, P. 2021a

Investigations of prehistoric barrows in Bačka – introduction. In: Jarosz, P. – Koledin, J. – Włodarczak, P. (eds): *Danubian Route of the Yamnaya culture. The Barrows of Vojvodina. The Yamnaya Impact on Prehistoric Europe 3*. Budapest 2021, 215–256.

WŁODARCZAK, P. 2021b

Sequences of graves in barrows from 4th/3rd millennium BC in the Danube-Tisza region. *Pontica* 53 (2021) 137–157.

YAROVY, E. V. 1979

Okhrannye raskopki u s. Bursuceni. In: *Arkheologicheskiye otkrytia 1978 g.* Moskva 1979, 491–492.

YAROVY, E. V. 1985

Drevneyshie skotovodcheskie plemena yugo-zapada SSSR (klassifikatsiya pogrebalnogo obriada). Kishinev 1985.

YAROVY, E. V. 2019

Osnovnye eneoliticheskiye pogrebeniya kurgana u sela Bursucheni v tsentralnoy Moldove (predvaritelnaya informatsiya). *Vestnik Moskovskogo Gosudarstvennogo Oblastnogo Universiteta. Seriya: Istoriya i politicheskiye nauki* 5, *Tsirkumpontika* (2019) 54–68.

List of contributors

Bernadett Bajnóczy

Institute for Geological and
Geochemical Research
Research Centre for Astronomy and
Earth Sciences
Eötvös Loránd Research Network (ELKH)
Budaörsi út 45, 1112 Budapest, Hungary
E-mail: bajnoczy.bernadett@csfk.org

Zdzisław Belka

Isotope Research Unit
Adam Mickiewicz University
ul. B. Krygowskiego 10, 61-680 Poznań, Poland
E-mail: zbelka@amu.edu.pl

Urszula Bugaj

Institute of Archaeology and Ethnology
Polish Academy of Sciences
ul. Sławkowska 17, 31-016 Kraków, Poland
E-mail: bugaj.urszula@gmail.com

János Dani

Déri Múzeum
Déri tér 1, 4026 Debrecen, Hungary
E-mail: dani.janos@derimuzeum.hu

Milosz Huber

Institute of Earth and Environmental Sciences
Department of Geology,
Soil Science and Geoinformation
Maria Curie-Skłodowska University
Al. Kraśnicka 2d, 20-718 Lublin, Poland
E-mail: milosz.huber@mail.umcs.pl

Paweł Jarosz

Institute of Archaeology and Ethnology
Polish Academy of Sciences
ul. Sławkowska 17, 31-016 Kraków, Poland
email: ptjarosz@gmail.com

Jovan Koledin

Museum of Vojvodina
Dunavska 35–37, 21101 Novi Sad, Serbia
E-mail: jovan.koledin@muzejvojvodine.org.rs

Maria Lityńska-Zajac

Institute of Archaeology and Ethnology
Polish Academy of Sciences
ul. Sławkowska 17, 31-016 Kraków, Poland
E-mail: marialitynska@gazeta.pl

Łukasz Majchrzak

Independent researcher
Kraków, Poland
E-mail: archeoluk@gmail.com

Danuta Makowicz-Poliszot

Institute of Archaeology and Ethnology
Polish Academy of Sciences
ul. Sławkowska 17, 31-016 Kraków, Poland
E-mail: danuta.mak@interia.pl

Piotr Mączyński

Institute of Archaeology
Maria Curie-Skłodowska University
Pl. Marii Curie-Skłodowskiej 4,
20-031 Lublin, Poland
E-mail: archeolublin@gmail.com

Viktória Mozgai

Institute for Geological and
Geochemical Research
Research Centre for Astronomy and
Earth Sciences
Eötvös Loránd Research Network (ELKH)
Budaörsi út 45, 1112 Budapest, Hungary
E-mail: mozgai.viktoria@csfk.org

Mario Novak

Centre for Applied Bioanthropology
Institute for Anthropological Research
Ljudevita Gaja 32, 10000 Zagreb, Croatia
E-mail: mario.novak@inantro.hr

Michał Podsiadło

Dolmen S.C.

Pl. Emila Serkowskiego 8/3,
30–512 Kraków, Poland

E-mail: thergo@o2.pl

Marcin M. Przybyła

Dolmen S.C.

Pl. Emila Serkowskiego 8/3,
30–512 Kraków, Poland

E-mail: megzyk@poczta.onet.pl

Anita Szczepanek

Institute of Archaeology and Ethnology

Polish Academy of Sciences

ul. Sławkowska 17, 31-016 Kraków, Poland

E-mail: anitaszczepanek2016@gmail.com

Bartłomiej Sz. Szmoniewski

Institute of Archaeology and Ethnology

Polish Academy of Sciences

ul. Sławkowska 17, 31-016 Kraków, Poland

E-mail: bartheque@yahoo.fr

Piotr Włodarczak

Institute of Archaeology and Ethnology

Polish Academy of Sciences

ul. Sławkowska 17, 31-016 Kraków, Poland

E-mail: wlodarczak.piotr@gmail.com



In 2016–2021, a Polish-Serbian research project focussed on Vojvodina’s burial mounds from the 3rd millennium BC. In its centre were the excavations of two Yamnaya culture barrows, Šajkaš and Žabalj, conducted in 2016–2018 in the Bačka area, on the western edge of the Eurasian steppe. The material brought to light at these sites is currently the most important set of sources on the burial mounds in Vojvodina, and is essential for the wider territory of the Pannonian Plain as well. This book presents the results of the project fieldworks and the specialists’ analyses completed thus far.

The project “Danubian Route of the Yamnaya culture” was financed by the National Science Centre (Kraków, Poland). Its implementation was possible thanks to a cooperation agreement between the Institute of Archaeology and Ethnology of the Polish Academy of Sciences and the Vojvodina Museum in Novi Sad.



THE YAMNAYA IMPACT ON PREHISTORIC EUROPE